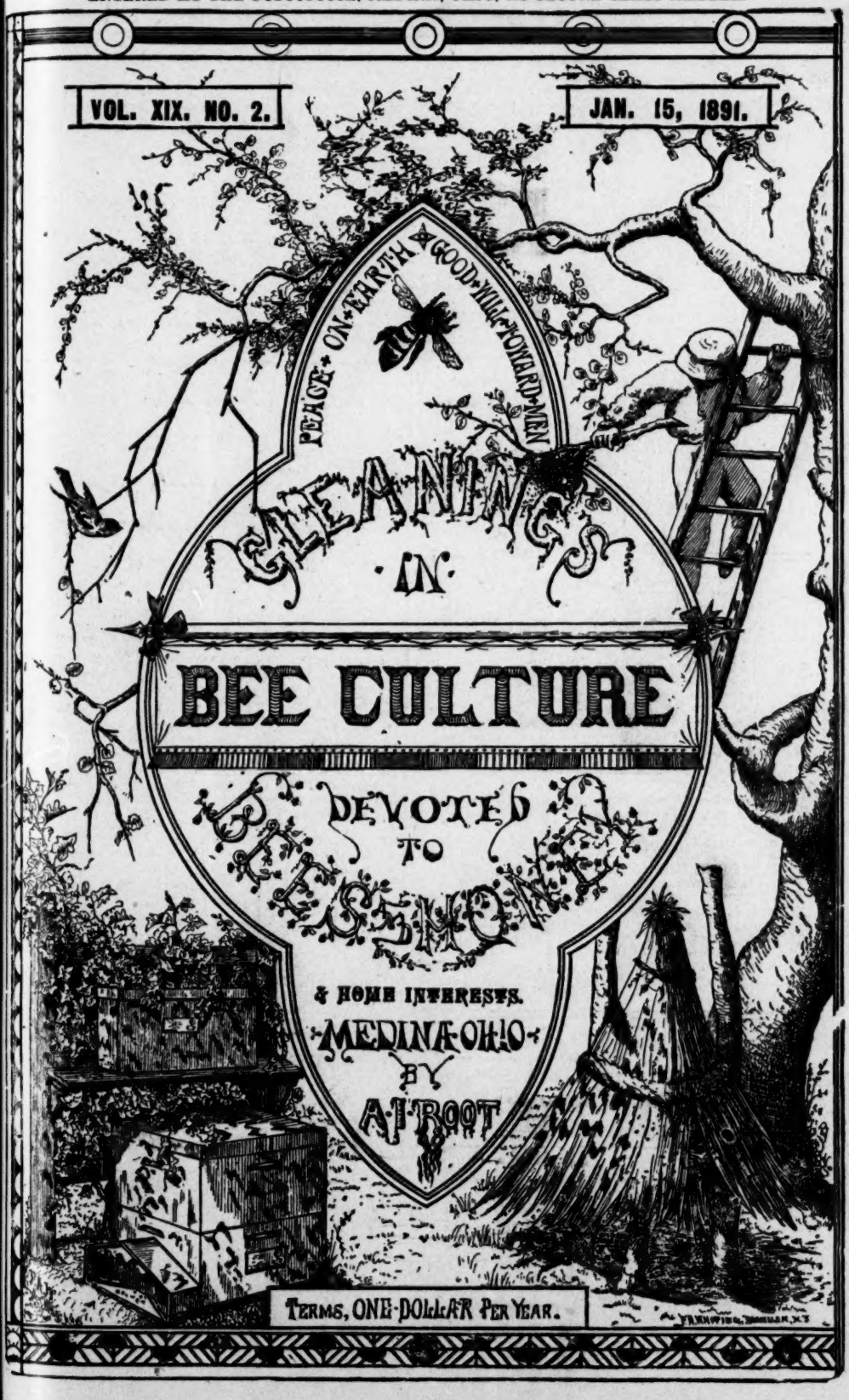
ENTERED AT THE POSTOFFICE, MEDINA, OHIO, AS SECOND-CLASS MATTER.

VOL. XIX. NO. 2. JAN. 15, 1891.



ADVERTISEMENTS.

We require that every advertiser satisfy us of responsibility and intention to do all that he agrees, and that his goods are really worth the price asked for them. Patent-medicine advertisements, and others of a like nature, can not be inserted at any price.

Rates for Advertisements.

All advertisements will be inserted at the rate of 20 cents per line, Nonpareil space, each insertion; 12 lines of Nonpareil space make 1 inch. Discounts will be made as follows:

On 10 lines and upward, 3 insertions, 5 per cent; 6 insertions, 10 per cent; 9 insertions, 15 per cent; 12 insertions or more, 20 per cent; 24 insertions or more, 25 per cent.

On 48 lines (¼ column) and upward, 1 insertion, 5 per cent; 3 insertions, 10 per cent; 6 insertions, 15 per cent; 9 insertions, 20 per cent; 12 insertions, or more, 25 per cent; 24 insertions or more, 33⅓ per cent.

On 96 lines (whole column) and upward, 1 insertion, 10 per cent; 3 insertions, 15 per cent; 6 insertions, 20 per cent; 9 insertions, 25 per cent; 12 insertions, or more, 33⅓ per cent; 24 insertions or more, 40 per cent.

On 192 lines (whole page), 1 insertion, 15 per cent; 3 insertions, 20 per cent; 6 insertions, 25 per cent; 9 insertions, 30 per cent; 12 insertions or more, 40 per cent; 24 insertions or more, 50 per cent.

No additional discount for electrotype advertisements.

A. I. ROOT.

CLUBBING LIST.

We will send GLEANINGS—		
With the American Bee-Journal, W'y	($1.00)	$1.75
With the Canadian Bee Journal, W'y	(75)	1.65
With the Bee Hive,	(30)	1.20
With the Bee-Keepers' Review,	(1.00)	1.75
With the British Bee-Journal,	(1.50)	2.40
With American Apiculturist,	(75)	1.70
With American Bee-Keeper,	(50)	1.40
With Bee-Keepers' Advance and Poultryman's Journal,	(50)	1.45
With all of the above journals,		6.20
With American Agriculturist,	($1.50)	2.25
With American Garden,	(2.00)	2.60
With Prairie Farmer,	(1.50)	2.35
With Rural New-Yorker,	(2.00)	2.90
With Farm Journal,	(50)	1.20
With Scientific American,	(3.00)	3.75
With Ohio Farmer,	(1.00)	1.90
With Popular Gardening,	(1.00)	1.85
With U. S. Official Postal Guide,	(1.50)	2.25
With Sunday-School Times, weekly,	(1.50)	1.75
With Drainage and Farm Journal,	(1.00)	1.75
With Illustrated Home Journal,	(50)	1.35
With Orchard and Garden,	(50)	1.40

[*Above Rates include all Postage in U. S. and Canada.*]

FOR SALE.

One 4-horse-power rotary engine. Will sell cheap to make room for larger power.

S. H. MUSSELMAN,
Blue Ball, Pa.

☞In responding to this advertisement mention GLEANINGS.

Cash for Beeswax!

Will pay 25c per lb. cash, or 28c in trade for any quantity of good, fair, average beeswax, delivered at our R. R. station. The same will be sold to those who wish to purchase, at 31c per lb., or 35c for *best selected wax*.

Unless you put your name *on the box*, and notify us by mail of amount sent, I can not hold myself responsible for mistakes. It will not pay as a general thing to send wax by *express*.

A. I. ROOT, Medina, Ohio.

EXTRACTED HONEY!

WE offer Fancy California Extracted Honey—amber (60-lb. cans) 2 cans to a case, 7½c; white (60-lb cans) 2 cans to a case, 8½c. Bee-men are sending in repeated orders, and using quantities. Also a limited quantity of Basswood and White Clover to offer. Will be pleased to fill your orders. We are the largest receivers of California honey west of the Rocky Mountains. S. T. FISH & CO.,
2d 189 South Water St., Chicago.

☞In responding to this advertisement mention GLEANINGS.

JUST OUT.

SOMETHING ENTIRELY NEW IN

HIVES!

CIRCULAR FREE.

Address

JAMES HEDDON,
DOWAGIAC, MICH.

2-34d Please mention this paper.

Wire Cloth.

For door and window screens, tacking over hives and nuclei for shipping, making bee and queen cages, and a variety of purposes. We have the following list of green and black wire cloth which is not exactly first class, but is practically as good for the purposes mentioned, and at prices MUCH BELOW the ordinary price. You can no doubt select from this list a piece to suit your needs. Price in full pieces, 1¾ cts. per square foot. When we have to cut it, 2 cts. In case the piece you order may have been taken by some one else before your order comes, please say whether we shall send the nearest in size, or cut one the size ordered at 2 cts. per ft., or give a second or third choice.

No. of Rolls, and Color.	Width, In's.	Length, Ft.	Sq. Feet.	Price of a Full Roll.	Pieces less than 100 ft. long. These figures are the number of square feet in each piece. Multiply by 1¾ cents for the price of piece.
10 green	8	100	67	$1.17	65, 65, 64, 63, 63, 63, 62, 54, 40, 33
25 green	12	100	100	1.75	44, green; price 77 cts.
2 green	16	100	133	2 33	
1 black	22	71	128	2.24	110 sq. ft., black; price $1.92
5 green	24	100	200	3.50	140, 40, 30, 5, green; 200 black.
54 green	26	100	217	3.50	This is below reg. pr. of 1¾ c.
14 green	28	100	233	4.08	224, 224, green.
7 green	32	100	267	4.67	133, green; price $2.33.
10 green	34	100	300	5 25	300, black; price $5.25
6 black	38	100	317	5.54	269, black; price $4.70
5 green	38	100	317	5.54	258, black, price $4.50
3 black	40	100	333	5.83	317, black; price $5.54
8 black	42	100	350	6.12	350, green; price $6.12
1 green	44	100	367	6.42	

A. I. ROOT, Medina, Ohio.

A Four-Color Label for Only 75 Cts. Per Thousand!

Just think of it! we can furnish you a very neat *four-color* label, with your name and address, with the choice of having either "comb" or "extracted" before the word "honey," for only 75 cts. per thousand; 50 cts. per 500, or 30 cts. for 250, postpaid. The size of the label is 2½ x 1 inch—just right to go round the neck of a bottle, to put on a section, or to adorn the front of a honey-tumbler. Send for our special label catalogue for samples of this and many other pretty designs in label work.

A. I. ROOT, Medina, Ohio.

Vol. XIX. JAN. 15, 1891. No. 2.

TERMS: $1.00 PER ANNUM, IN ADVANCE; 2 Copies for $1.90; 3 for $2.75; 5 for $4.00; 10 or more, 75 cts. each. Single number, 5 cts. Additions to clubs may be made at club rates. Above are all to be sent to ONE POSTOFFICE.

Established in 1873.
PUBLISHED SEMI-MONTHLY BY
A. I. ROOT, MEDINA, OHIO.

Clubs to different postoffices, NOT LESS than 90 cts. each. Sent postpaid, in the U. S. and Canadas. To all other countries of the Universal Postal Union, 18 cts. per year extra. To all countries NOT of the U. P. U., 42 cts. per year extra.

STRAY STRAWS

FROM DR. C. C. MILLER.

How are your bees wintering?

NEW-YEAR'S DAY—rain; very unusual.

THE AMERICAN BEE JOURNAL, in its new form, is very neat.

NEWMAN is calling the roll of the dead or missing bee-journals.

HONEY has 12 to 23 per cent—normally 18 to 21 per cent—of water; the rest is sugar.

MY INTRODUCING-CAGE beats McIntyre's when you get a queen from abroad, or take a queen to an out-apiary.

THE *British Bee Journal* is a rather loose affair. It is never stitched together. It's not loose in its views, though.

MCINTYRE'S INTRODUCING-CAGE is ahead of mine for changing a queen from one hive to another in the same apiary.

CYPRIANS AND HOLY-LANDS are not much talked about nowadays. Does any large honey-producer use them exclusively?

TEA-LEAVES kept in pans of water are recommended for drinking-places for bees, by W. Woodley, in *British Bee Journal*.

THE INDEX of the *American Bee Journal* deserves commendation for giving with each subject the name of the author.

DOOLITTLE says, "If you wish a large yield of section honey, keep prolific queens, and let the brood-combs alone, after they are once filled with brood in the spring."

QUEENLESSNESS, according to Doolittle, in the *American Bee Journal*, can never be detected from the outside, if the bees have the means of raising a queen. Thus the few things I thought I knew about bees are diminishing in number.

BEES IN CELLARS are always quieter—at least mine are—just after a windy time, whether cold or warm. A still, muggy time is worst. Don't tell me cellars need no ventilation.

OUTSIDE CASES for wintering are among the things that I meant to have tried this winter. I'm "dreffful" anxious to know how those 28 at Medina pull through the winter, if we have any winter.

"STRAY SWARMS" is what "Observer," in *Canadian Bee Journal*, calls this page. He says, "I venture the opinion that it will be an interesting page." I always did think "Observer" was venturesome, and lacking in judgment.

BEES HANGING OUT can be made to "go in and attend to business, simply by the use of a smoker," according to the A B C. I don't believe a word of it. I tried it lots of times. They'll go in, of course; but does it make any difference in their work?

ADULTERATION IN AUSTRALIA was deprecated at a meeting of bee-keepers there, where it was declared, "Large quantities of an article labeled 'honey' are manufactured here, in which there is not a fractional part of real honey—in some cases none at all."

BRITISH WEATHER has been unusually severe. In England, Nov. 28, the thermometer marked 5 above zero—"twenty-seven degrees of frost," as they call it—a very rare thing, and snow covered the ground from two inches to two feet. The *British Bee Journal* says, "Indications everywhere point to the probabilities of an exceptionally severe winter."

BINDERS for GLEANINGS and other papers I've thrown aside. When the year is up, I put the numbers straight together and get some one to hold them so, while I drive in, and entirely through, three two-inch wire nails, at the right place to stitch them together. Each nail is drawn out just as I want to sew the cord through the hole m ade by the nail.

A RECORD-BOOK is a thing I shouldn't like to be without. I've started mine for 1891 already. I keep in it all sorts of memoranda of interest. Mine's about 13 by 6, costs 25 cents, and lasts a year for 300 or 400 colonies. Each colony has its place in numerical order, three colonies on a page.

"OBSERVER," in *Canadian Bee Journal*, thinks too much time was taken up at Keokuk with "flowery nothings." I always did think "Observer" was a person of good judgment. But, "Observer," it isn't pretty to say, "Americans pay but little heed to any thing Canadians want." What do you want?

INCORPORATION OF THE NORTH AMERICAN under State laws, troubles the *Canadian Bee Journal*. It thinks incorporation by Congress would make it more what its name signifies. Why, bless you, Mac, the point of incorporation doesn't limit its field of occupation. Washington isn't as near Canada as Springfield.

A GOOD ONE on A. I. Root! Cheshire says, "My own bee-house long since came under the chopper; but Mr. Root thinks well of the house-apiary," and then quotes about a page in its favor from the A B C. Friend Root, I don't pity you one bit. You've no business to let such misleading things stand in a standard work.

BEE-JOURNALS AT COST is what the *Review* hints every bee-paper but the *Review* is. Some have undoubtedly been issued at less than cost, but the standard journals, at least part of them, either lie egregiously or they make a good thing of it, independently of the supply-trade. I'm sure they give us both sides of every question too. Look here, W. Z., you keep on making a good paper, and let the others alone. If you don't, I'll tell on you about advertising "cream" for sale, and then not even furnishing skim-milk. The others furnish the supplies they advertise.

MOUNTAIN LAUREL, *Kalmia latifolia*, is the plant that yields poisonous honey. Cheshire says it grows in "damp places," and adds, "Happily, our American cousins are now never likely thus to suffer, thanks to drainage, the plow, and the bee-farm." For a man who is so exacting as to other authors, isn't that a bit reckless? If he were to see it growing among the rocks of my native hills in Western Pennsylvania, he'd change his views. "Damp places," where the ground runs nearly straight up! Some of those pebbles 6 feet through would hinder a plow.

TEMPERATURE IN CELLARS is higher at top than at bottom. Macpherson, of *Canadian Bee Journal*, reports a visit to Allen Pringle's cellar, where two thermometers are kept, one at top, the other at bottom. At top it was 48°; at bottom, 42°; a difference of 6°. I never found so much difference as this and other reports make. I have just been trying my cellar. I put in two thermometers. Each showed 46°. Then the thermometers changed places. Top, 48°; bottom, 44°—a difference, you see, of 2° between the top and bottom of cellar, and a difference of 2° in the thermometers.

[Now, look here, doctor. You have been thus far very quiet and peaceable, and, as a rule, respectful, bundling around among your "straws;" but when you say that you do not believe a word of something I tell you, and which has been told for years in the A B C book, I think it time to stir a little myself. A good many times a new swarm will hang on the outside of the hive, and not go to work. In such a case I would put a comb with a little unsealed brood inside, then with a smoker make them crawl in; and when they find the brood, and find what a nice place they have, they usually pitch in and behave as the orthodox have always done with the "shining" hour. Another thing, our good friend Cheshire made a mistake and you turned right in with him. If both of you will read the opening remarks in regard to the house-apiary, you will find a string of objections, and something like the following: "Most apiarists prefer to work in the open air, to being cramped up in a building." Again, "In a building we are obliged to get the bees out of the room every time we open a hive, and bees are very untidy when crushed by careless footsteps," etc. What rickety thermometers you must keep in your cellar! I hope you did not buy them of any respectable supply-dealer.]

GENERAL CORRESPONDENCE.

SEVERAL QUESTIONS IN QUEEN-REARING ANSWERED.

DOOLITTLE REVIEWS THE MATTER.

The following questions have been sent in for answers; and to simplify matters I will number the questions and answers.

1. Why does not all the progeny of a black queen, mated with an Italian drone, or an Italian queen mated with a black drone, show the same markings?
2. Will the eggs and larvæ of a queen two months old produce as good queens as if she were one or two years old? If not, why not?
3. If we make a colony queenless, removing all the eggs and brood, and give this queenless colony a comb containing 1000 eggs, not nearly as many queen-cells and cells of capped brood will be found on the tenth day as we gave eggs. What becomes of the eggs? If destroyed, why? If used in the jelly given the queen larva, would the eggs of a black queen affect the coloring of the young queen reared from Italian larva?
4. What is the least number of days after hatching, the weather being favorable, required before a young queen will leave the hive for fertilization?
5. Will there be any difference in the time of leaving the hive for fertilization, between a queen hatched in 10 and one hatched in 16 days?
6. How many days after hatching, before the worker-bee leaves for labor?
7. In what does their first outdoor labor consist—gathering honey, pollen, water, or propolis?
8. Will a queen reared from an old queen about to be superseded be as good as when reared from the same queen in her prime?

1. For the same reason that *no* "blood" of two different colorings can be mixed and have the progeny of the mixture show a uniform coloring. Take any of our animals, the sheep, the hog, the cattle, horse, dog, cat, etc.; birds of all colors as to feathering; or the vegetable kingdom, and we find the same laws governing them in this matter of coloring, just the same as we find regarding the bees. Plant Marblehead and Hubbard squashes side by side, so that the bees can mix the pollen in the blossoms of each, and see what a mixture of color you will get as a result. If the progeny of a mismated queen should show a uniformity of coloring, bees would be an exception to the laws governing the most of animated creation.

2. According to the prevailing opinions of others, no; but according to the most careful observation on my part, yes. After years of careful watching along this line, I fail to see any difference between a queen raised from the very first eggs laid by any queen, and those laid by the same queen two years later; and I do not believe there is any difference. Will those who doubt this fact tell us wherein the

difference lies, giving facts to support their ideas? Has any one noticed that the first workers hatched from any queen were in the least inferior to those produced by the same queen later on in life, every thing otherwise being in a normal condition? The size of the cradle and the amount of food given govern this matter, it seems to me, rather than the age of the queen.

3. Some of the eggs are removed to give place to the larger and more commodious queen-cells. Why more than these are removed I do not know, unless it is because the colony is thrown into an abnormal condition. As to what becomes of the eggs, I have no hesitation in saying that the bees eat them; for I have repeatedly seen bees eating eggs as they came from the queen. Because the bees eat eggs, it does not necessarily follow that they in any way enter into the food given to the young queen larva, for, according to my observations, thousands of eggs are eaten by the bees when they have no idea of rearing queens. And if they did enter into the royal jelly they could only form so small a part of the whole that little or no chance as to coloring could be given. But if, as nearly all claim, this royal jelly is an animal secretion, how could it possibly affect the color of the young queens, even if the royal jelly was formed wholly from a diet of eggs from black queens? I had supposed the old Kirby theory was exploded long ago. From many years of experience, I have failed to find that black nurses, or eggs or larvæ from a black queen, in a hive from which Italian queens were being reared, had any thing to do with the coloring of such queens.

4. Five days after maturity is the least number that I ever knew to elapse before the queen went out to meet the drones. But a queen does not always hatch on her maturity, for very many are held in their cells from one to five days by the worker bees, after they would have gnawed off the capping to their cell and come out, could they have had their own way. Queens are more often held in their cells in this way than is generally supposed. In one instance I opened a hive and found a young queen piping away with a vehemence I had never known before. After looking the hive over I found a queen-cell with a queen in it which I had overlooked when cutting out cells from this hive some time before. As there was plenty of bees in this hive I took the frame having this cell upon it, bees and all, and set it in an empty hive, together with a frame of honey, thus forming a nucleus. The queen from this cell took her wedding-flight successfully the next day; and in two days more, or three days in all from the time I set the sealed cell in the hive, she was laying worker eggs regularly in the comb which her cradle was on. This is a fact, and is as I have it down in one of my diaries. I told it at a bee-convention once, not explaining the aforesaid maturity part, and no one would believe it. Thus it will be seen that the days from *hatching* are not a safe guide to go by.

5. Yes; the queen hatched in 10 days will, as a rule, be slower in going out. In round numbers, 3 days in the egg form, 6 days in the larva form, and 7 days in the sealed state, is the rule for all queens from a colony in a normal condition. Thus it will be seen that the queen which hatches in 10 days must have been from a larva at least 3 days old, when the bees commenced to change it from a worker to a queen. Nine-day queens are very slow in being fertilized, while, out of a batch of queens which once hatched in 8½ days, only two became fertile at all; one being fertilized after she was 20 days old. These queens could scarcely be told from a worker, and neither lived to be over three months old.

6. They can be forced out at three to four days old; but when the colony is in a normal condition, 16 days is the rule. For observations along this line, proving the same to be facts, see back volumes of the different bee-papers.

7. Either or all, just according to the wants of the colony, and according to the supply to be had from the fields.

8. Yes; and I would add, that some of the best queens I ever had in my apiary were reared by this superseding process, the old queen living from one day to one year after the young queen, or the queen-cell for her, was started. The answer to question 2 will hold good here. I have never seen any difference in queens or workers reared from queens about to cease life, as compared with the same from the same queen when in her prime. Has any one else? If so, will he please tell us about it?

Borodino, N. Y., Jan. 1. G. M. DOOLITTLE.

[In regard to Qu. 3, where queenless colonies are given a comb full of eggs, the latter are surely not *always* destroyed; for at one time we practiced this plan for getting cells, nearly a whole season; and I did not particularly notice the disappearance at the time, although I have noticed something of the kind since. Will others who have experimented particularly in this line let us know about it?]

THE HOFFMAN FRAME.

THE NEW HEDDON HIVE.

Friend Root:—According to my promise to you at the Keokuk convention, I will give you my experience for the last 8 years with the "Hoffman frame." My first bees were hived on Root's metal-cornered frames, in Simplicity hives. I soon found, however, that they were too light and frail. They would sag down when well filled with brood or honey, and I soon replaced them with the Hoffman frame, of which I procured a sample to work by, from friend Hoffman himself, or friend Nellis, I have forgotten which. I found them far superior to the metal-cornered frame—no sagging, and, what was of decided advantage to me then, as I was engaged in migratory bee-keeping, was the ease and dispatch with which I could prepare full colonies for transportation; and, later on, when engaged largely in raising and shipping queens and nuclei, I found nothing to equal them for safety and convenience in shipping; and at the present, while I am engaged in raising comb and extracted honey in out-apiaries, they fill the bill to my satisfaction, though they are not quite so convenient as the closed-end frames in the horizontally divisible brood-chamber, as used by friend Heddon in his new hive, of which I have 50 or more in use at present.

While using the Hoffman frame for the past eight years, as stated above, I have used all-wood dovetailed frames of different thickness and width, some sawed for wiring, some pierced for wiring, and some without wire, and none have given the satisfaction the Hoffman frame has. Why, then, not adopt it exclusively? For this reason: Their cost. My principal business for the last six years has been that of raising and selling queens, three-frame nuclei, and full colonies of bees; and the prices I have been compelled to sell at have prohibited the use of so costly a frame as the Hoffman.

Now, however, as I am raising honey on the out-apiary plan, I shall use the Hoffman frame and Dovetailed hive, in connection with the new style of Heddon hive, with its fixed frames;

and I may say here, that, with specialists who make handling bees their sole vocation, the new Heddon hive is one of the best, if not *the* best, ever devised, so far as my limited experience goes. Why not adopt and use it exclusively, then, instead of the Hoffman frame and 8-frame Dovetailed hive? Same reason—cost. Another is, the new Heddon hive and frame are not standard, and the Hoffman frame and Dovetailed hive are, and you can not fill orders for nuclei or full colonies as readily as you can with the Hoffman frame. This may look like advertising the divisible-brood-chamber hive, but I do not mean it so; but friend Root can strike it out, if he thinks best, though, as friend B. Taylor, of Forestville, Minn., has used for 20 years such a hive, and demonstrated by great crops of honey its advantages, its merits should be more generally known.

Another and great advantage of the Hoffman frame is the ease and certainty of correct spacing; and this, to one who handles many frames (and especially at out-apiaries, where the time to work with the bees is limited, if you return home the same day, and the distance is great), is of great advantage, as I have proven to my complete satisfaction, as one can do more than double the work in a given time, and do it far more correctly.

I think I have said enough on this subject to convince any one of the advantages of a fixed frame that is a standard L. frame also, and I am sure none who gives it a fair trial will reject it. The only objection is their first cost; but they are well worth all they cost, to one who expects to make a living by raising honey, and especially those situated as I am, who, in order to get a fair crop of honey, *have* to run out-apiaries. E. T. FLANAGAN.

Belleville, Ill., Dec. 26.

[The Hoffman frame used to cost anywhere from $3.00 to $3.50 per 100; but now they can be obtained for $2.00 per 100 almost anywhere, or, in quantity, for less money yet. The matter of *cost*, then, does not figure as largely as it did. I would rather use a *good* frame at double the cost than a poor frame that costs half the money.

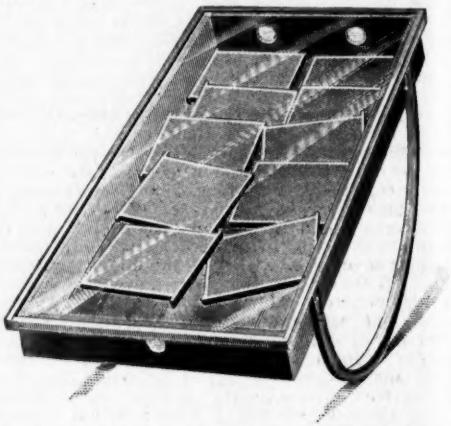
That's all right about the new Heddon hive. We want the truth. If it has merit, let it be sung.]

THE SOLAR WAX-EXTRACTOR AND HONEY-EVAPORATOR.

H. R. BOARDMAN'S DEVICE.

In GLEANINGS of Oct. 1, Mr. S. F. Newman notices, in a very complimentary way, my "improved solar wax-extractor." I almost think I ought to apologize for not responding sooner to your request to tell all about it in GLEANINGS; but I have been delaying in hopes of being able to send a picture of it or a model. I made a mammoth solar extractor about two years ago, that was illustrated and described in GLEANINGS. This did the work well, but had no very easy means of adjustment. It was imperfect, heavy, and clumsy to handle. I was satisfied with the principle, but not with the manner of its construction. After spending considerable time in dreaming and experimenting I wrought out the "invention" to which Mr. Newman calls your attention.

The improvement consists in mounting upon rockers instead of wheels, by which means it can be adjusted, or turned, with perfect ease. It also dispenses with the chamber at the lower end, for holding the wax-pan. In fact, it is little more than a plain shallow box with a few modifications, covered with glass, and adjusted at an inclination to the sun, for its heat. The combs are thrown into this box, when the wax is melted and runs down the inclined bottom, leaving the residue. The wax can be drawn off or allowed to cool, when it can be removed. The lower end of the extractor is covered, so that it leaves it in the shape of A. I. Root's bread-pan feeders with sloping sides, so that it really combines the wax-pan with the extractor.



BOARDMAN'S SOLAR WAX-EXTRACTOR, IMPROVED.

There are ventilators in each end covered with wire cloth, that can be opened or closed at pleasure, when used as an evaporator.

I am sure that Mr. Newman does not overrate its merits. It has been a success with me, not only as a wax-extractor, but for evaporating and melting honey.

It is an old chestnut, that granulating is the test of purity in honey. I am using honey on my table now that is clear and limpid, that has been treated only by being placed in this evaporator for a while at the close of the honey season. This is the only extracted honey I have ever been willing to say I thought equal to comb honey. Isn't this the secret of some of the California honey not candying? I suspect it is.

No, I have not got them to sell, but I could make them on short notice, if wanted. I can not say definitely what they would cost, but they would not be expensive. I think they would cost some less in proportion to their size than the small ones now in use. Of course, it is not patented.

I have had some difficulty in finding just the right material for the inside, or lining. Wood seems to do as well as any thing I have tried. It must be of narrow stuff, matched, and well painted a drab color. The only objection I have found to wood is, it shrinks, from the constant heat it is subject to. Tin does nicely, but does not absorb heat as does something of dark color. I have tried paint on tin and iron linings, but they do not hold paint as well as wood. The hot wax dissolves or softens the paint, and it scrapes loose in cleaning out the residue, or "slum gum," as our California friends say. Mr. Doolittle advises the use of Russia iron; but iron will not do. I have rejected a lining of Russia iron, after giving it a thorough trial, on account of its discoloring the wax. It won't do to use iron when it comes in contact with melted wax. H. R. BOARDMAN.

East Townsend, Ohio, Dec. 5.

[You have no doubt presented the bee-keeping fraternity with a valuable implement; and a-

though the idea is not new, you have simplified its manner of construction. As a solar wax-extractor and honey-evaporator, it is probably ahead of any thing else before the public, in the way of cheapness, utility, and convenience. For a small solar wax-extractor alone, we like the Doolittle style the best; but for wholesale melting, yours is perhaps the better. We shall probably get orders for them; but if friend Boardman has any idea of making them, and will make them and offer them for sale, we shall be glad to leave the field entirely open to him, so far as we are concerned.]

PAINTED VS. UNPAINTED HIVES.

WHITEWASH AS A SUBSTITUTE; WHY THE DOVETAILED JOINT IS SUPERIOR TO EVERY THING ELSE IN CALIFORNIA.

In March 15th GLEANINGS, 1889, Mr. Doolittle has an article advocating unpainted hives, saying that, as the paint prevents evaporation of moisture, painted hives are much more damp and cold, and that bees in the unpainted ones will swarm from one to two weeks earlier in the spring. A. I. Root, in his foot-notes, recalls the fact that he had often seen water running out of painted hives, and says he is pretty sure there would have been no such ice and condensation had the hive been unpainted. Thinking over the matter I remembered that, in my painted hives, I had had many combs rotted by mildew. I was increasing my apiary rapidly at that time, and had many hives to build. I decided not to paint them. The interior valleys of California are hot. Where my apiary is, the mercury often registers in the shade 110° Fahrenheit for eight hours a day and eight days at a time. Well, this heat on my black unpainted hives causes the combs to melt down *en masse* unless the hive is shaded or very much ventilated. One day in July, one of these hot days came. I had wilted in the morning as soon as the sun hit me; and, though knowing that my bees needed extra ventilation, I lay under the dense shade of an oak and read "King Solomon's Mines." In the evening I crawled off to look at the bees, and it seemed to me there was a creek of honey running out of the entrance of all the unpainted hives in my apiary. I lost some forty colonies outright, and there were many others badly damaged. The white painted hives stood the ordeal vastly better, though even in them, when the entrance was not full width of hive (like your Dovetailed hive), there were some combs melted down. My combs were mostly new ones, and very full of honey. After that disastrous experience I whitewashed my hives, and I now believe that that is the proper treatment for them, as it combines both the advantages of the painted and the unpainted hives. The whitewash does not prevent evaporation of moisture; and by giving a fresh coat each spring the hives much surpass in whiteness, and therefore in coolness, a painted hive, especially if it has not been painted for two or three years. Mr. Doolittle, too, seems to have had some unfavorable experience with unpainted hives since writing his article of March 15, 1889; for, May 15, 1890, one year and two months after, he closes a letter by saying he now "prefers to paint his hives and let them stand in the sun."

Your Dovetailed hives, both in body and style of cover, are well suited for this climate, as nails alone will not prevent boards from warping here.

This has been an unfortunate year for me in several respects, commencing with the going to pieces of my fine apiary from excessive swarming, so that I got less than half as much honey as I should have done. Next a Dago sets out a brush fire one hot August day, and in the conflagration which ensued, 21 of my hives of bees were burned, and many more melted down. I saw the fellow set out the fire; and as he refused to pay damages, which he was well able to do, I prosecuted him; but he came to court with some of his countrymen, and, by perjury, convinced the jury that he was asleep under a tree at the time the fire started. He has recently served a notice on me, telling me to keep my bees from coming on his land, claiming that they destroy the *grass*. WM. G. HEWES.

Newhall, Cal., Dec. 20.

[You have given us a valuable article. The evidence that you present for hives painted white or whitewashed, as against hives unpainted, is convincing; for certainly no one could have had a better opportunity to observe the comparative differences. Dr. C. C. Miller does not paint his hives. He argues, if they will last him fifteen years, he can afford to throw away his old hives that have never been painted, and buy another set, because the money saved in paint and time will buy the new hives. Besides that, he would have all the advantages of modern improvements in the new hives. The testimony of bee-keepers generally is against having hives unpainted. It is generally supposed that whitewash will not preserve wood. If prepared right and put on right, I think it will. At this point I stopped and talked with an experienced mason—one who served an apprenticeship of seven years in England. He says that whitewash will preserve wood. Its mode of preparation for outdoor work is as follows: To three pounds of lime add one pound of cheap grease, and then add hot water until it is of the right consistency. It should be put on the wood while it is hot. If put on when it is cold it is liable to rub off and soil clothing. Many years ago we used a whitewash made of water lime and skim-milk, to cover our old American hives. This seemed to hang to rough unplaned wood very well, but we discarded it because it did not look as neat and tidy as hives that were planed and painted. Whitewash will perhaps prevent melting down of combs as effectually as white paint. It is not only very cheap, but it can be applied with a whitewash-brush.

If any hive will stand it without painting, it is the Dovetailed; and I have no doubt that the lock corner, as some prefer to call it, will stand a great deal more than any other in a climate like that of California. Some of the bee-papers argued that there was no need of a stronger corner. Our own apiary, and my observation of other apiaries, show that there is such a need; and in California it is a necessity. It is too bad that you could not get hold of that Dago. They are rather "tough" citizens, and it is often better to get along with them with as little trouble as possible.] E. R.

THE BEET-SUGAR INDUSTRY OF THE UNITED STATES.

ONE OF OUR CORRESPONDENTS GIVES US A GLIMPSE OF WHAT IS GOING ON.

Friend Root:—In a recent issue of GLEANINGS, some one intimated that beet sugar is not as pure as that manufactured from cane. We have been using beet sugar made at Grand Island, this State, and it is good enough for us—in fact, we think it is much whiter and sweeter than granulated sugar obtained elsewhere. I

have taken pains to get a sample of beet sugar manufactured at the factory at Grand Island, and send the same to you to-day by this mail. If you do not pronounce it equal to or at least as pure as any in your market, I am mistaken in your good judgment. I know by actual experiment that it will do for feeding bees; it is fully as good as cane sugar.

At Norfolk, in this county, a beet-sugar factory has been erected, which, when completed, will be the largest in the world, and perhaps the day is not far distant when you and your readers will *call* for Nebraska sugar-beet sugar.

Nature has not been very lavish with her gifts, but she has given us soil in which are grown the finest beets in the world; and according to government analysis they contain the greatest amount of saccharine matter.

I send you a paper containing an account of the great enterprise at Norfolk. A. C. TYRREL.

Madison, Neb., Dec. 20.

[The sample of sugar received is certainly equal to any thing I have ever seen or tasted. The granules are perhaps a little larger than ordinary, but they are as clear and white as pieces of the clearest ice, and remarkably pure to the taste, and free from any thing suggesting the brown or cheap sugar. As so much interest has been expressed in this matter, we have thought best to make an extract as follows, from the paper which friend T. was so kind as to send us—*The Norfolk News:*]

HOW BEET SUGAR IS MADE BY THE DIFFUSION PROCESS.

The *News* can perhaps give a better idea of the "diffusion" process of sugar-making employed by the Oxnards, and of what the new factory at Norfolk will do, by inviting its readers to follow the beets from the farmers' wagons and cars, through the various processes, until the beautiful granulated sugar drops in three grades of fineness into bags or barrels ready for the table or otherwise.

The beets are stored in huge bins, with a V-shaped bottom terminating abruptly over a canal that runs along its entire length, the bottom being composed of short planks which can be removed when it is desired to let the beets drop down into the canal. As wanted, the short planks are lifted up, and the beets drop down into the canal. A rapid stream of water floats them along, soaking and washing them as they go, until they reach the building. Here they are dipped out by a great bucket-wheel which spills the water back into the canal, and carries the beets up and drops them upon a chute, which takes them through the wall of the main building and into one end of a long cistern, say three feet deep and wide. In this a shaft with wooden arms, set in a spiral, stirs the beets in the water and keeps moving them toward the other end. Here a broad-bladed screw, set slanting, lifts the beets out of the water; carries them up and drops them inside an immense cylinder, which gives them many whirls in water and drops them out at its elevated end. Next they pass over a long platform made up of cylinders covered with stiff bristles revolving in opposite directions. These brush out the last vestige of soil in the depressions of the beets as the beets glide over them, and they drop off clean into a chute which carries them through a wall and lands them in a perpendicular elevator with buckets which carry the beets to the top of the main room, where a chute conducts them into a receptacle, standing on scales, which tips them out as often as 2200 pounds drop in. Thence they slide into the mill, which cuts them, a ton in three minutes, into little corrugated strips as large as a hen's quill, and two to four inches long. These strips are called "cossetts," a technical French name which answers as well as any. If ground fine or into thin shavings they would pack in the diffusion cells and not let the water run through freely. Next they slide into the diffusion cells, which may be three or four feet in diameter, and eight or ten feet high, and hold one to one and a half tons of pulped beets. A number of these cells arranged and connected with each other is called a diffusion battery, just as several cups used in galvanic electricity are called a battery. The successive cells are usually numbered 1, 2, 3, 4, etc. Each cell has a cap, or cover, which can be turned to one side, or be closed air-tight when put in place, with rubber under the outer rim, and brought down with a powerful lever screw. The flat bottom is similarly closed, but has a false bottom a little above it—a strong copper plate full of fine holes. A metal hot-water pipe enters the top just below the cover. Another similar pipe below runs out from the open space between the bottom and the perforated false bottom. This ascends and enters the top of cell No. 2, and in doing so passes through a steam pipe or chest. From No. 2 a similar pipe runs to No. 3, and so on through any number of cells in the battery. The tops of the cells being opened, they are filled with the cossetts, or strips of beets, and the covers are fastened down. Hot water is then let in through the pipe, the required pressure being obtained by placing the hot-water tank at any desired height. As will be seen, the hot water passes down through the contents of cell 1; then out at the bottom and up over into the top of cell No. 2, and down through its contents, and so on through the other cells. The water, being cooled in passing through the material, is heated in the steam-chests. In practice, thermometers on these indicate by a dial on the outside when the liquid is of the desired temperature, and the attendant turns the steam on or off from any steam-chest as needed. The same water passes through all the cells, often obtaining all the sugar it can dissolve before reaching the last one. By the time ten or twelve successive waters have passed through cell No. 1, all the sugar is extracted, its bottom is opened, the exhausted cossetts are dropped into a large receptacle below, and new material is put in. The fresh-water inlet pipe is changed to No. 2, and No. 1 becomes No. 12, or the last of the series, the saturated juice leaving this. Cell No. 2 having already had 11 doses of water passed through it, the first supply of fresh water passing through it removes its last vestige of sugar. It is then refilled with fresh pulp, and becomes No. 12 of the series, No. 1 becoming No. 11. So the process goes on round and round. The sugar-saturated liquid from the diffusion battery and its receiving-tank is carried into great tall tanks, in which the sweet liquid is mixed with milk of lime, which unites with and destroys native acids in the beets, and other impurities. After a while the carbonic-acid gas which was caught from the kilns which burn the lime on the spot (outside), to make the milk of lime with, is let in through the liquid, and unites with and solidifies any excess of lime not already solidified. This liquid is then carried off into the filter room, where it passes through a remarkable series of filters, which remove the lime and other impurities. The clear liquid-looking-like thin molasses then flows down into shorter tanks, where a little more lime is added to remove any acids escaping the first liming. It is then again pumped to a set of clean filters in the filtering-room, and comes back into the main room to be pumped as required into the great condensing boilers, four in number. The great air-pump removes the air and steam produced inside the first boiler, so that the liquid boils down very rapidly at a low temperature, 135° to 140° Fah. After partial condensation the liquid passes to the second for further concentration; then into the third and finally into the fourth. The heat and pressure of each succeeding boiler are regulated to the increasing density of the syrup. From the last condenser, the concentrated syrup passes into large reservoir tanks, and is next pumped into the "vacuum pans," which are really great air-tight, upright cylinders, from which air-pumps exhaust the rising steam. In these vacuum pans the syrup becomes a thick mass of sugar crystals and molasses. From these, buckets carry the mass and drop it into the "centrifugals." These are iron cylinders, say 3 feet high and 4 feet in diameter, the outer rim covered with fine brass wire cloth. Part are working while the others are being emptied and re-supplied. They revolve about 1000 times a minute, the outer rim traveling 10,000 to 12,000 feet, or over 2 miles a minute! The sugar flies against the outside, and in two or three minutes all the molasses is thrown through the wire gauze, and drops into a receptacle below, to be further treated and concentrated, and to produce another lot of crystallized sugar. The sugar, now white, is sprayed with a forcible jet of mixed air and cold water, all of which flies through the gauze, leaving the sugar a mass of clean white grains, a trifle damp. The bottom is opened, the sugar drops into a receptacle below,

whence it is taken by a screw elevator into the drying-room.

Here is a 30-feet-long revolving cylinder, 5 or 6 feet in diameter, sloping downward. Its inner surface is full of little shelves, while in the center is a small cylinder kept warm with steam inside of it. As the sugar is brought up from the centrifugals, it drops into the elevated end of the great cylinder. It is picked up by the little shelves, and when they come around to the top (as the cylinder slowly revolves) they drop the sugar off upon the inner warm cylinder, which dries it, and it falls off to be picked up by other shelves and carried up again. As this cylinder stands sloping, the dry sugar works down toward the far open end. This end terminates in a rim of fine brass wire, next to which is one of a coarser mesh. All the fine-grain sugar, composing a great deal of it, now entirely dry, falls through the fine wire and goes down a chute into barrels or bags in the shipping-room below. The next grade in fineness passes through the next screen, and falls down another chute. The coarsest grains fall out of the end into a third chute.

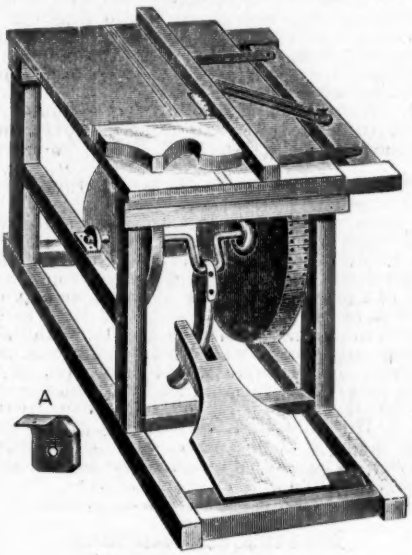
An interesting arrangement is the current of air sucked through the long cylinder from the far end, which takes up moist vapor from the drying sugar and some fine sugar dust. This air is driven through a long room with partitions nearly across, first from one side and then from the other, twenty or thirty of them. These check and cool the current of air, and all the fine sugar dust drops on the floor as pure sugar flour. It is usually re-dissolved and concentrated, and crystallized into coarser grains through the centrifugals, so nothing is lost. Even the molasses is mainly worked into sugar unless it shall be worth more in the syrup form.

[To indicate something in regard to the present demand for the seed of sugar beets, I will mention that, while visiting Ferry's immense seedhouse in Detroit, I saw stacked up in one of their great rooms such a vast quantity of seeds in bags that I asked the guide in astonishment what it was for which there could be such a demand. He told me that it was sugar-beet seed from France, and that they had just put in two shiploads. We have for several years past raised the beets on our own grounds, just for the fun of it. As visitors go through our fields I frequently cut off a piece of beet, and cut it into little strips, and pass it around. The visitors always make exclamations of surprise. The real sugar beet, in the right kind of soil, is almost as sweet as the licorice-root which children get at the stores. No wonder they get sugar from it in immense quantities by simply washing it out from the beets with pure water, by the diffusion process, so plainly described above.]

THE STEWART HOME-MADE SAW-TABLE.

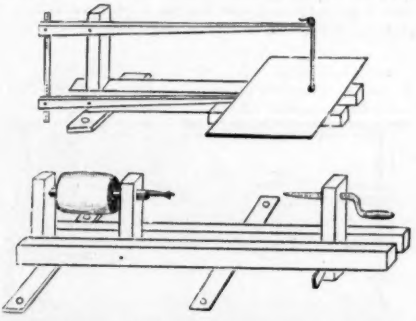
PLAIN INSTRUCTIONS HOW TO MAKE ONE WITH A TURNING-LATHE AND SAW ATTACHMENT.

Mr. Root:—As per your request I send herewith a sketch of my home-made saw-table, with lathe and scroll-saw attachments. The framework of my saw-table is made of 2x2½-inch scantling, and is 28 in. square. The sills are 18 in. longer in front, for hinging the treadle. The frame is mortised together, and pinned. The tread-hinge consists of a piece of scantling with a hole in each end, and is just long enough to go between the sills. A hole is bored in each sill, and a hickory pin driven through the sill and into the end of the tread-hinge. The treadle is made of a ¾-in. board, 8 in. wide, securely nailed to the hinge, and is tapered to 3 in. wide at the end where the pitman is attached. A block in the shape of a wedge is securely nailed on the under side of the narrow end of the treadle, with a mortise for the pitman. The pitman is hard wood, with an iron cuff. The crank-shaft is a ¾-inch iron rod. The crank has a six-inch sweep. The drum that runs the mandrel is 22 in. in diameter, with a three-inch face. The wheel at the left is 15 in., and runs the lathe and scroll-saw. They are fastened on with taps and washers. The table is made of inch boards nailed to two pieces of scantling, 4 in. longer than the frame. The parallel bar is so hinged that it can be raised



A HOME-MADE SAW-TABLE.

and turned over, and will hang down on the right side of the table when not in use. A space 1½ in. wide is left in the table for the cut-off gauge, which is made of two pieces, one the length of the table, 1x1½ in., the other 1x6 in., tapered to 3 in. at the end to the left, and nailed securely together at right angles. The table is held in place by a pin in each corner, and can be lifted off or on in an instant. The mandrel



SCROLL-SAW AND TURNING-LATHE ATTACHMENT.

is the one you sell for $3.50, and is fastened on to two pieces let in at each end in the top pieces of the frame. The saws are six-inch rip and cut off.

I have some home-made cutter-heads for beading, and making small moldings. They have but one bit. They are made of a block of hard wood, 2 inches square, and an inch thick, with three corners cut off (see A at the left of the saw-table). The bit is fastened on with a screw. Through the center for the saw-arbor I bore with an inch bit, ⅛ inch deep, and then bore through with a ⅝-inch bit. The washer that goes on between the nut and the saw must

be left off, as this block would not let the nut go on if you use the washer. There is a stud set on the piece of framing that crosses under the treadle and under the top piece of the frame. This, and the front corner-post are the hangers for the crank for the scroll-saw. A 1¼-inch hole is bored in the top piece of the frame for the pitman for scroll-saw. This stud, wheel, and pitman, are not shown in the drawing. I use Rogers' saw-clamps. The arms are fastened on with bolts threaded to within one inch of the head; one tap between the arm and standard, and one tap on the other side of the standard. The table, and also the saw, are removed when using the scroll-saw or lathe attachments.

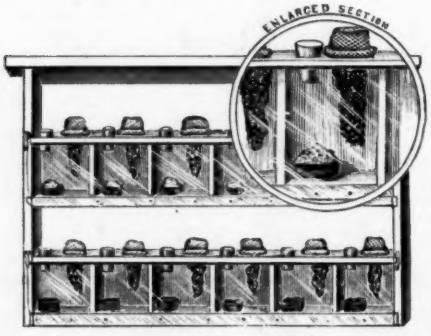
Sonoraville, Ga., Dec. 3. R. W. J. STEWART.

[Many thanks, friend S., for your excellent and explicit instructions, together with the sketches, which show almost at a glance how the whole thing is made. There are many of our geniuses who will readily be able to make a home-made buzz-saw; and many of our farmers, of a mechanical turn of mind, during the odd days of winter, when their time is not worth much, can construct one to advantage. There are others who would make one, even though the machine would cost more in the end, just for the fun there is in it, and the after-satisfaction of showing it to their friends. W. Z. Hutchinson, of the *Review*, a few years ago made a home-made saw-table. Others have done so. But the one above is perhaps as simple as any.]

GOLDEN'S CELL-HATCHER.

HOW TO CONSTRUCT AND USE.

Friend Root:—I send you to-day a photograph of my queen-hatcher and protector. This I believe to be the handiest and most common-sense device ever used. One glance at the device as shown will undoubtedly convince any queen-breeder of its utility and feasibility, from the building of a cell to the disposing of the queen. Having used a number of them the past season, and to some extent last year, and from a practical knowledge, I can heartily recommend them as above claimed.



GOLDEN'S HATCHER.

To make, take a brood-frame; remove the bottom-bar. Fasten horizontally, as above, 4 bars ⅛ inch wider than the end-bars, spaced two inches, the ⅛ inch projecting on one side, or front of the frame. The upright division pieces are the same width as the end-bars, and spaced, also, two inches apart. A strip of tin is tacked on each lower bar, and forms a sort of groove, or rabbet, for the glass front to rest in, held in place by a small button at each upper corner. A wood separator is tacked on the back. Before putting together, the bars are spaced, and two holes are bored to each compartment. The little trays to hold the good candy or honey are made by dipping a square-pointed stick in cold water, then in melted resin and beeswax, equal parts, then pressing to the bottom of the vessel of water, making a flat bottom to the little tray. When putting them into the compartments, warm them, and press them in place. They will seldom get loose, and will not leak or get out of shape. The wire cap is fastened at the back side of the frame by a small wire, which answers as a hinge. The cap protects the cell from the bees, and, whena hatched, the young queens are often fed through the meshes, by the bees.

The hole with the cork in is used to drop honey into the little trays, and to dampen the Good candy when it becomes dry. To liberate a queen, throw back the wire cap; lay your cage over the hole, and the queen will immediately ascend thereto.

The device is easily constructed, is always ready, and is adapted to all stages of a queen, from the egg by the Doolittle plan to its maturity, and may be kept an indefinite time in any colony.

The device answers most admirably in feeding sugar candy, or stimulating for early brood. For feeding, place squares of soft candy in each compartment, and tack on a one-inch strip of a wood separator in place of the glass front. The wood is warmer than zinc, and the bees have better access to the candy.

Some one may say that the bees will build comb in the spaces above and below the cages. I answer, they might do so; but in two seasons' practice I have never had a particle of comb built or even started. J. A. GOLDEN.

Reinersville, O.

[Your device is very similar to one used by Henry Alley and also by A. E. Manum. You will find the latter described and illustrated on page 629, Aug. 1, 1889. Instead of using the little wax-tray, Mr. Manum takes bits of combs and cuts one side clear down to its base. This rests horizontally on the bottom of the cage, the sliced-off side down. It is more convenient to get the queen out of one of your cages, and also, I think, to insert a queen-cell. All these devices have been used for years, and are on the same general plan. They answer their purpose very well.] E. R.

OUTSIDE WINTER REPOSITORIES.

HOW TO PREVENT THE ROOF-BOARDS FROM BECOMING MOIST, AND SO ROTTING.

I wish to thank Mr. Doolittle for his kind comments, in GLEANINGS of Dec. 15, page 876. I desire to say to Bro. D., that I believe our cellar will last longer than he apprehends, for two reasons: 1. Because there is no dampness as yet, noticeable on the sides and top; 2. Because I used very heavy oak timbers for covering. There are four 4x6 stringers laid on edge lengthwise on the top, and across these I laid two thicknesses of oak slabs, that are from two to three inches thick. On these I placed a layer of rye straw, to keep the dirt from rattling through. Up to date the bees are wintering nicely in it. The roof timbers are dry, as I proved by scratching matches on them. We keep the temperature at 40° by opening or closing some of the doors. Our eight-inch ventilator seems to draw out the moist air. Perhaps the fact that Mr. Doolittle's cellar was two feet lower in the ceiling than ours, and that he did not have as much ventilation, will account

for its being so moist as to rot the timbers. It may be that, when very cold weather comes, and we shall be obliged to close our ventilator, the moisture may then collect as it did in his.

I think the discussion of such repositories is profitable, for the reason there are so many bee-keepers who need something of this kind. I am ashamed to tell it, but it is true, that I have lost in the past what I believe would have amounted to hundreds of dollars in bees and honey by trying to shift along without proper facilities for wintering. In the future I expect to place about two-thirds of my stock in out-cellars, and winter one-third outside in Bristol-Langstroth hives. I am trying twelve of them this winter.

Now, Mr. Root, every once in a while some bee-journal gives GLEANINGS a dig, or criticises some of your methods. With all its faults I would not give up GLEANINGS for the whole of them. GLEANINGS is the friend and helper of all bee-keepers, old and young, big and little. All such squibs remind me of a fly attacking an elephant. The best thing they can do is to let "that corner" alone. HARRY LATHROP.

Browntown, Wis., Dec. 25.

[The reason that moisture condenses upon a surface is because the latter is colder than the surrounding air. We find evidences of this almost every day on the windows in winter. If these surfaces can be kept as warm as the air inside, no moisture will condense. The boards forming the roof, or support to the dirt, of Mr. Doolittle's repository, were rather thin compared with the great mass of dirt above. This conveyed its lower temperature through the boards, and caused them to be colder than the air inside, and consequently to collect drops of water. The flagging-stones, subsequently adopted by Mr. Doolittle, being a better conductor of heat or cold, were little if any better—in fact, I think worse, on account of the moisture, although, of course, they would not rot. Your roof, being 6 inches through to the dirt, would form a good non-conductor, and hence would collect no moisture, even without the ventilator. At any rate, it would be interesting for you to try it and report.]

DEVELOPING A HOME MARKET.

THE EFFECT OF A HONEY ADVERTISEMENT IN GLEANINGS.

While some advocate building up home markets for honey, I should like to tell my experience. Several years ago I undertook to increase the demand for honey by leaving some with nearly every merchant in the towns around me, so as to bring it before the eyes of everybody. I was delighted at the prospect of selling large crops in the future. But what was my surprise when, one year ago last September, I found every one of those merchants well supplied with honey before there was a demand for it. Evidently I built up a market for others which left me out in the cold, with a large crop on hand. You see, the year was a good one, and the farmer had honey, and sold it for what he could get. But I learned through GLEANINGS that the crop was short in the East, so I told the editor that I had honey to sell. Before long I had inquiries and offers from 7 or 8 different States, and I soon sold more honey than I had. I bought, and sent away all I could get; and before spring I had a demand for my partly filled sections.

This year would be a good time to build up a home market, as very few farmers have honey to sell. But I still receive calls from that ad't in GLEANINGS, and some of them are such that I can't refuse, while I have honey; neither can I keep still and not let you know what is expected of the readers of GLEANINGS. Credit to whom credit is due.

A few months ago I had a call for honey from a firm in Indianapolis. We agreed on the price. He offered to pay cash in advance. I was afraid the quality of my honey was not what he expected, so I wrote him like this:

"I suppose you have looked me up in regard to my standing, or you would not have made that cash-in-advance offer. If you will send me the price of 100 lbs. I will send that amount—a fair sample of what I have."

In a few days the money came, and with it a letter saying:

"We never inquire into the standing of a bee-keeper who reads GLEANINGS and raises honey to sell such a year as this."

I think all who responded to that advertisement gave credit by saying, "I saw your advertisement in GLEANINGS." One neglected to sign his name. I had no more honey to sell, but wanted to answer that letter, and did not know how.

HOW TO KEEP THE ENTRANCE CLEAR IN THE CELLAR.

If the back of the hive is 4 inches higher than the front, slope 4 in 20, the entrance will not clog with dead bees. The hives can be tiered up by sliding the next back three or four inches. I have three cellars tiered that way, and they never need looking after. I have practiced it several years. J. HANDLE.

Savanna, Ill., Jan. 2.

BEES AND FRUIT.

VALUABLE TESTIMONY OF A FRUIT-GROWER.

Dear Bro. Root:—The question was recently asked me by a neighbor of my friend Dr. N. Q. Higbie, "Do bees injure fruit?" Now, Bro. Higbie keeps some 60 swarms of bees, while the neighbor in question keeps none; and there seems to be a very prevalent idea among those who are unfamiliar with honey-bees and their nature that their presence, in large numbers at least, works an injury to fruit-blossoms which very materially lessens the following crop of fruit. My answer to the gentleman was a very emphatic "No, sir." "But," said I, "on the contrary I consider the bees a very important adjunct to the various natural agencies which are brought to bear in the developing of a bountiful fruit crop. Having been for a number of years engaged in growing small fruits for market, I have come to see the value of bees to such an extent that I have purchased a few colonies, and intend to increase the number."

If fruit-growers understood the botanical structure of fruit-blossoms thoroughly they would recognize more readily the agency of bees in the fertilization of blossoms. Many of us are familiar with these things, but by far the greater number know or think but little about them; and it is for the good of the latter class that I write this.

If, for instance, we take the blossom of the common cherry, as an illustration, we find it is composed of the calyx, or outer covering of the bud; immediately inside of this comes the corolla, with its several petals of white. Now, when this flower is opened and spread out in all its beauty and natural perfection before us, we shall notice, in the center of this, numerous small hairlike projections, called stamens; and, exactly in the center, the pistil, which terminates in a small bulb at the bottom, which is to

become the fruit. Now, the numerous stamens produce pollen, which is inclosed in minute anthers at the head of the stamens, and is the fertilizing matter which must be brought in contact with the stigma, or top of the pistil. Thus the ovules, or seed-vessels, are fertilized, or impregnated, and develop into perfect fruit. One of the agencies for the proper distribution of pollen is the wind; but sometimes if we happen to have a few still days during the blossoming period this would be inadequate to the designed purpose; so nature has placed a little drop of sweet deep down in the flower, at the base of the stamen; and our little friend the bee comes flitting about in search of nectar for his future winter store, and, discovering the tempting morsel, he literally stands on his head in an effort to reach it, and in so doing his back becomes dusted with pollen from the stamens; and as he reaches down into the flower his back is brought in direct contact with the pistil of the flower, thus performing a very important work in nature's great panorama.

Who has not noticed bees coming into their hives, in the season of fruit-bloom, with their backs so covered with pollen from the flowers that they had the appearance of being a different race? Truly there are wonderful things in nature, and it seems as though no individual can fail to see the agency of a higher power in the design of these things. Verily, "All things work together for good to them that love God."

Elsie, Mich., Jan. 2. I. A. WOOLL,
Proprietor of the Oak Grove Fruit-Farm.

[Friend W., this is a matter that ought to be strongly emphasized and most emphatically taught. Right in sight of where I am writing is a strawberry-bed of strong, rank, thrifty plants. They are Bubachs; but there has not been a decent berry in the whole patch for two years, just because there are no perfect-flowering plants near them that they may be fertilized. They were red with berries, but they were all stunted, twisted, poor, insignificent specimens of strawberries. Now, my opinion is, that many of the poor, imperfect cherries, plums, apples, etc., that we see in various localities is because there are not bees enough kept to insure perfect fertilization. Market-gardeners have tested this matter so thoroughly that they now invariably keep one or more hives of bees in every greenhouse where they undertake to raise fruit, cucumbers, or any thing that requires the agency of the bees.]

ERNEST'S NOTES OF TRAVEL.

A VISIT WITH DR. C. C. MILLER.

After leaving the Dadants, Dr. Miller and I took the train for Marengo; and such a time as we did have visiting! On the sleeper that night we talked till the "wee sma' hours" of the morning; and after sleeping for two or three hours we again commenced it. We changed cars and then began to argue about some of the new fixings, and the probable outcome of thick top-bars, fixed distances, outside winter cases, and width of sections. Although I was very sleepy, Dr. Miller would, every once in a while, say, "Now, about that width of section. Are you sure that it would be wise to recommend to your trade 1⅞ instead of 1⅞ next year?"

I was *so* sleepy that I did not know what was wise, and, in fact, I did not care very much. I finally began to revive a little bit under the temporary stimulus of a good crisp apple which the senior Dadant handed me just before we left. Dr. M. would not eat between meals, but I felt a good deal better, whether it was in accordance with the laws of health or not. In response to his question I said, "Yes, sir; the trade demands a section a little less than a pound; and we, as supply-dealers, are obliged to cater to their demands, more or less. Besides," said I, "doctor, don't you see that with 1⅞ sections you can use a follower and wedge in a super 12⅛ wide inside? From what I saw in my trip in the East I am thoroughly satisfied that the sections wedged up in supers save a great deal of afterwork in scraping. All the 'big guns' in the East do it. Almost all L. supers are 12⅛ wide, and in these you can not wedge up sections 1⅞ thick with a follower and wedge."

The doctor nodded his head with a somewhat doubtful assent.

"But, see here, Ernest," said he, "do you think it is right or fair to sell a section, that weighs less than a pound, for a pound section?"

"No, I don't," I replied; "but sections are sold by the *piece* largely, nowadays."

So on we argued. I do not quite remember how we came out. Every once in a while our conversation broke off with, "Oh! by the way, Ernest, I want to know about those Hoffman frames;" or, "You haven't said yet how your bees are wintering in the cellar;" "Say, doctor, you did not tell me how your thick top-bars work, that you 'doctored' up with pieces of separator stuff."

Whenever friend M. cornered me in argument it was convenient to change the subject. So on we discussed persons and things until we reached Marengo. I had fixed out in my mind's eye that the town was so and so; but every thing was just the other end to. As we stepped off the train the doctor said, "Yes, there's Em with the horse."

Most of our readers know that "Em" is Dr. Miller's sister-in-law, the one who helps him in the bee-yard. Although I felt as if I knew her, of course I had to go through the formality of the usual introduction.

We drove for about half a mile, till we arrived at Dr. Miller's home. It is situated quite a little distance back from the street, upon a considerable knoll overlooking quite a stretch of country. The doctor had told me that I need not expect to see any thing very orderly; that his hives were such as nobody but himself would tolerate, etc. He evidently did not intend that I should raise my expectations very high.

Just as I alighted from the buggy I turned about, and there was his apiary, ready to go into the bee-cellar soon. This, if I remember correctly, comprised all of the home yard and a part of an out-apiary. The apiary looked very neat and orderly, and the hives—why, they did not look bad at all. It is true, they were not painted, and never have been. They had formerly been old ten-frame Langstroth portico hives. Gradually the doctor had imbibed the idea of eight instead of ten frames, like the rest of us. To make them eight-frame he pried off one side of the hive, cut off about two inches of the ends, replaced the side removed, and narrowed the cover of the bottom-board, and it was not such a very long job either.

The hives looked very much like ordinary Dovetailed hives without the dovetail. At the time of my visit, the bottom-boards had all been reversed, and screwed on upside down—that is, in such a way as to leave a two-inch space under the frames for winter. A large-mesh wire cloth was let down into perpendicular grooves in the bottom-board, closing the entrance to rats and mice while in the cellar. Bees, of course, could pass in and out.

While the doctor was putting up the horse I

was thus engaged in the apiary. It was a little cold out, and so we went in to warm, where I had the pleasure of meeting Mrs. Miller. She, like her sister, is a true type of one of those whole-souled, kindly-faced Scotch women whom it is a genuine pleasure to meet. Both of the women-folks know how to handle bees, and Dr. Miller asks for no better assistants in his yards.

DR. MILLER'S BEE-SHOP AND HONEY-HOUSE.

If there is any thing that gives a fair index to a bee-keeper's notions, and of his methods of work, it is his workshop, or, rather, its contents. Over in one corner you will find things that he has tested and found wanting. And then, there are other conveniences that he could not dispense with. Over on that shelf maybe something new under the sun, for which he has very great hope. Perhaps the shop is orderly, and perhaps it is full of useless truck.

Now, I had expected to find Dr. Miller's shop a model of—disorder, and perhaps my expectations *might* have been realized; but it so happened that the women-folks have a hand in the work in the shop, and the doctor says it is "real handy" to have them around to straighten things up once in a while. Why, no, his shop was very orderly. He did not have a lot of expensive tools, but I noticed that he had good hammers, good saws, and a good assortment of nails arranged in very conventent boxes. These boxes the doctor has promised to describe, and his description will appear in a forthcoming issue soon.

We fell to arguing on the subject of T supers versus wide frames. He is still very much pleased with T supers; and the more he uses them, the more he seems to like them. But then, he says he does not know when he will cast them aside for something better. Of course, I argued for the topless wide frame; viz., the section-holder.

"Why," said I, "it protects three sides of the sections from the travel of the bees. I always noticed that the exposed surfaces of sections become a little bit yellow in time. If honey is coming in rapidly, and the sections are removed as soon as capped over, this yellow soiling is not so apparent."

The doctor insisted that it was not so bad but that his customers would tolerate it, and, besides, he could secure a crop of honey in T supers with less work. He had tried a few section-holders, and did not like them; and in evidence he showed me a few of them that I had sent him to be tried.

We pulled over several piles of T supers. In all, I noticed the bees had chinked in considerable propolis between the *edges* of the sections.

"Now, doctor," said I, "I want you to try wedging them up tight another year, and see if you do not save time in scraping propolis off. By the way, doctor, did you use those thick top-bars I sent you?"

"You sent them too late," said he, "and I hadn't time to put them in the hives them."

"Yes, I remember we were very much behindhand, and could scarcely fill our regular orders."

"I will show you the top-bars that I reinforced with separator stuff later, in the apiary."

Then the doctor showed me his double-tier shipping-cases. He used thin veneer boards between the two tiers of sections. This virtually made two single-tier cases, and at quite a saving in expense. Two strips of glass are used to display each tier. Turning from this we went upstairs.

"What does all this mean over in this bin?" said I.

"That is where we put our cast-away Clark smokers."

"That looks bad," I said. "Either you are very hard on smokers or else the Clark smoker is a very poor one."

Picking one up I observed that it had the old-style small blast-tube.

"Yes," said the doctor, "they are the old style of smokers. They did not last very long, and it was cheaper to get new ones rather than to fix the old ones up. Your new smokers, with large blast-tubes, are a very great improvement, and they stand hard usage in the apiary well."

"Do you use them in preference to the Bingham?"

"Yes, on some accounts we like them better. Em is partial to them because she can blow smoke with them at a long range, and she can force it clear through the tall piles of supers on account of the strong blast."

The doctor showed me an improvement, which he had made. With a wire nail he had punched 25 or 30 small holes in the sliding fire-door of the smoker, and said sliding door was made to shut tight so the sparks could not drop out. The rear draft has to pass through the aforesaid perforated holes, and these are too small to drop fire. This made the smoker almost faultless. The improvement pleased me so well that I said we would put it on our new smokers.

"What is that hanging up against the ceiling?" said I.

"That is a foundation-fastener that somebody kindly sent me. I do not know that I shall ever use it."

There were other things that had been sent him in the same way, and which he had neither the inclination nor time to try. Among them were some things that I had sent.

We then went out into the apiary. As usual, on the matter of covers we could not agree. Dr. M. wanted his cleats nailed without grooving on the cover-board, and he did not want the cover itself to stick over the hive. I insisted that a board is less liable to warp if let into a groove. Besides, in making hives in large quantities, these grooves are an easy thing to make. Some of the doctor's covers, I noticed, were a little warped, but then they had been long in use.

"But there is one thing I must have," said he, "and that is end cleats on the hives for handling them. Your handholes are hardly sufficient."

"But those cleats stick out in the way, and are an extra expense," I urged; "and if you would once get used to handholes I think you would like them."

"But, see here," he said; "in carrying hives into the cellar, all I have to do is to catch an endless rope over the ends of the cleats, and, with an assistant, the hives are easily picked up and carried into the cellar; and, when set in their places, the rope is easily removed. Your wire bails can't be disengaged so easily."

"Oh, yes!" said I, forgetting all about the handholes, "let me be your assistant in this job."

Dr. Miller went down into the cellar and produced a large soft rope. Lest some of our readers have forgotten how he picks up his hives and carries them into the cellar, I will here reproduce the engraving we made a year or so ago.

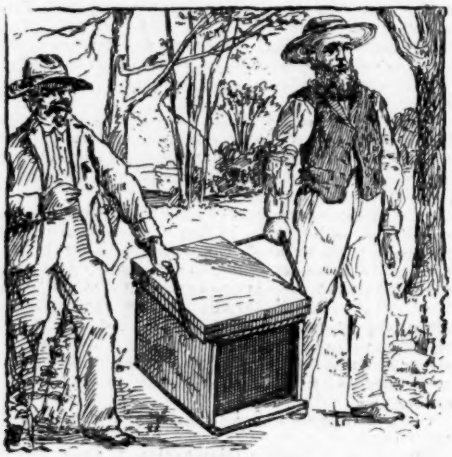
He quickly slipped the rope over one of the ends of a hive, and "There," said he, "get hold of the other side."

I did so. It was certainly very handy. We carried in a few colonies, and put them in the cellar.

"That's fun," said I, "but don't you like those bails which I sent you, for lifting up bottom-board and all?"

"No, I don't think they are nearly as convenient."

"And now," said I, "if I could have you at Medina, as you have me here at Marengo, I believe I could make you think they are at least good, but perhaps not quite equal to your ropes, with cleats on the ends of the hives to carry."



DR. MILLER'S METHOD OF CARRYING HIVES INTO THE CELLAR.

He has two bee-cellars—one under the house, and one under his workshop. Both are good-sized—about 15x15x7 feet, each capable of holding from 150 to 200 colonies, I should think. Neither was grouted, and the bottom was simply pounded clay. It had a hard dry surface, and could easily be swept. The walls had just been whitewashed—not so much for appearance' sake as for a purifier. It is well known, that whitewash is a purifier of walls. After a cellar has had bees in it over winter, it needs not only good airing but cleansing.

After we had stepped from the cellar I asked to see his thick top-bars. He did not know exactly where the hives were; but by a little hunting we found them. There was no burr-comb on top of them, and so far he regarded them as a success; but he was not so positive as I that they would take the place of honey-boards entirely. Dr. Miller, you know, is never positive about any thing. He is always open to conviction.

We then went into the house, for it was a little cold outside. After we sat down we talked queens. I was quite interested in his experiments in raising queens. He had not been successful with the Doolittle method, but Alley's plan had worked very nicely.

"Doolittle," I said, "makes it work to perfection. Why can't you?"

"I can not tell," said he; "and we were very careful to follow his instructions to the letter."

Dr. Miller now produced his record-book. His hives are all numbered, and each number corresponds to a space in the book. As we sat there that evening looking the book over, I was very much interested in reading over the memoranda of the several colonies.

Having been up late for several nights, I retired early. I spent a delightful Sabbath with Dr. Miller and his family, and had the pleasure of seeing him officiate as superintendent of their Sunday-school. The doctor is considerably interested in Sunday-school work. As most of our readers may know, who have attended conventions, he has a big talent "along that line."

To be continued.

THE WORLD'S COLUMBIAN EXHIBIT.

SUGGESTIONS IN REGARD TO THE APIARIAN DISPLAY, FROM DR. A. B. MASON.

Friend Root:—My "noddle" has done lots of thinking about the apiarian exhibit at the World's Columbian Exposition for 1893; and yesterday, Dec. 29, I thought of this plan for State work:

Let each State bee-keepers' society appoint a committee to look after the securing of an appropriation by the State legislatures or assemblies, for the making of a suitable exhibit. Also another committee to see that the honey, bees, beeswax, foundation, and every thing relating to our industry in their State, is collected and made ready for exhibition; also choose the best man or woman they may be able to secure, to go to Chicago and put every thing in the best possible shape and position for the best possible display, and look after the State's exhibit during the exposition, and then repack every thing and return to the owners.

"Now, this all looks easy enough on paper," some will say, "but how are we to be paid for our trouble and expense?"

Well, that is just what has bothered me, and is what I have been trying to "grasp by the horns." This very subject helped to get me 500 miles from home to attend the convention at Keokuk, in the hope that some one I might meet would solve the difficulty for me. Vain hope! No one I consulted knew more than I did about it. They were all like the mischievous boy John, in school. We have all heard of him, if we've not seen him. When the teacher asked Jim what he was doing, he replied, "nawthin'." The teacher then asked John what he was doing. The reply came promptly, "Helping Jim."

Till yesterday I've not been able to think of a plan, and found no one who could give me any "aid or comfort." I've thought over and over the offering of premiums in some shape, but nothing satisfactory presented itself. With the premium plan, somebody (and probably several somebodies) would "get left." By the plan I suggest, each would get just the amount he will be entitled to.

The plan is this: Let each one who is willing to help make his own State exhibit what it ought to be, notify the committee above spoken of as to what and how much he will exhibit, making an itemized bill of what he is willing to furnish. For example, some one says, "I will furnish—

500 lbs. comb honey (basswood) in 1-lb. sections, 25c per lb., 100 lbs.	$18 00
100 lbs. comb honey (buckwheat) in 1-lb. sections.	
500 lbs. extracted honey (white-clover) in 2-lb. Muth honey-jars; single, 35c; dozen	3 75
1 straw bee-hive, 50 years old.	
1 smoker (Bingham's)	1 75
1 colony bees (Italian) in Langstroth portico hive	8 00
1 colony bees (Carniolans) in Simplicity hive	6 00

Every package, or article of every kind, to be *distinctly* marked with the owner's name and postoffice; and if for sale, have the price also marked on it. Then let the committee say what they think best to have placed on exhibition, and then the owner can prepare and ship all to Chicago, with all charges paid, directed to the party having charge of the arranging and caring for the exhibit.

The reason I suggest that the committee say what should be sent is this: Perhaps ten or twenty might be willing to send one or more

bee-hives, colonies of bees, etc., when but one of a kind would be needed; but the more honey and beeswax sent, the better.

Now for the most important part—the *pay* for all this work, risk, and expense.

From the amount appropriated by the State, pay all expenses incurred at Chicago, including the pay of the party having charge of the exhibit, unless otherwise provided for by the State. Then divide the remainder among the exhibitors according to what they have on exhibition, so that one exhibiting a colony of bees or a crate of honey or other articles, will get the share to which he may be entitled.

A person sending 2000 lbs. of honey would be entitled to twice as much pay as one sending 1000 lbs., provided other things are equal; for certainly no reasonable person who sends a thousand pounds in tin cans could expect as much pay as one who sends the same amount nicely put up in glass receptacles of different styles. But there are unreasonable people in all pursuits, and ours is not an exception.

When the exposition is over, the person in charge should repack, without charge, and return to the owners every thing not sold.

With such an arrangement, all things would be in common for the display from each State. The honey belonging to A, B, and C, would be used just as though it all came from one person, so as to make the best possible display; and each package being marked with the owner's name would tell to whom it belonged.

It is more than probable that parties placed in charge of some of the State exhibits will know but little about arranging things so as to make the best display, and perhaps have less taste than knowledge. In such cases, some one who *has* the taste will have to be hired to do the arranging.

Perhaps the next N. A. B. K. A. meeting will formulate some plan for general adoption; but in the mean time, working and planning should go forward. A. B. MASON.

Auburndale, O., Jan., 1891.

LATER.

The secretaries of some of the State bee-keepers' societies have written me for suggestions to be submitted to their societies at their coming conventions; and yesterday, Jan. 5, I answered three of them, giving the above plan in brief, because their societies meet before this will appear in GLEANINGS.

Since writing the above I have attended the Michigan State bee-keepers' convention at Detroit, and suggested the above plan to them, and they have started "the ball rolling," and appointed the needed committees.

Another suggestion might perhaps not be out of place. Some States have no bee-keepers' societies to organize the work. Would it not be a good plan for the leading bee-keepers of such States to get together and organize, or, by correspondence, agree upon some plan, and appoint suitable persons to look after the needed legislation and appropriation, and for doing all other needed work? for if this matter is left over till next winter it may be too late.

A. B. M.

MAKING SINGLE-WALLED HIVES OUTDOOR WINTER HIVES

BY THE USE OF BUILDING-PAPER.

Apropos of the discussion concerning double or single walled hives, I suggest a simple, inexpensive, and practical plan for the construction of hives.

Tack one or two thicknesses of building paper all around the inside of the hives, which is to be kept in place by tacking on narrow strips of wood or tin. Put a layer or two on the bottom-board, and over that nail half-inch lumber the size of your bottom-board. It will cost but 15 or 20 cents extra. To prepare your bees for winter, all that is necessary is to put on the upper story, place over the brood-frames some cobs or a Hill device; fill a small gunny sack with leaves, press it down tightly so as to prevent heat escaping upward, and your bees are in the best possible shape for outdoor wintering. The sacks can be stored in a dry place when not in use, and used for years without replenishing. I have found that there is no necessity whatever for dead-air spaces and great bungle-some hives. This I have demonstrated by actual experiment. Paper is a non-conductor of heat and cold. Wrap your feet in a piece of strong paper, and you can ride all day in the coldest weather with warm feet. Put a newspaper around your body and you can withstand the most intense cold. I put paper covering over my bees to keep them warm till I put them in the cellar, and for a number of seasons I did not remove it until I placed them on the summer stands. A. C. TYRREL.

Madison, Neb., Jan., 1891.

[Very possibly the building-paper will answer. If you mean tarred paper, it would be rather distasteful to the bees. Paper itself is very warm; and when Mr. Danzenbaker was here a year ago he was continually advocating layers of paper instead of chaff packing. He argued that it was just exactly as good, and a great deal cheaper. It is hard to say just yet what will answer for our northern localities; but enough has been suggested to set us to experimenting in earnest.]

[In addition to what Ernest has said, I will say that paper lining for hives is a very old idea, and has been taken up and dropped several times within the last 25 years. One great objection is, that it gets damp and wet. The hives become soggy, and they can not be dried out as can a chaff-packed hive. I should like to have Doolittle and others, who once used paper, to tell us why they gave it up. Our house-apiary was made with several thicknesses of building-paper, with air-spaces between them; and although it is above ground, it is a cold, damp, soggy structure, even in the summer time. Perhaps a very loose, porous paper might be found that could be put on in such a way as to let it dry out as chaff does.]

FORETELLING THE WEATHER, ETC.

POPULAR SUPERSTITIONS.

Mr. S. Morrett, Akron, Ind., wishes me to answer through GLEANINGS the following questions:

1. "Would killing chickens by a mink make them in any way unfit for table use?"

I see no possible reason why it should.

2. "Do any of our animals, like the insects or higher animals, by their preparation for winter or otherwise, show that they are in some way forewarned as to whether the winter will be severe or mild?"

I have no idea that there is a grain of truth in such views, although I know that they are current among many, especially of the last generation. The same people plant in the moon, think fireweed grows spontaneously, that chess turns to wheat, and that patent medicines have startling virtues. I believe a better education dispels such views.

3. "Many claim, that, when the muskrat

builds high, there will be severe winter or high water."

Very likely; this is just as likely to occur as though the little rodent built low. Happily the muskrat does not make the weather.

4. "Some bee-keepers say, if the drones are killed early, the winter will be severe, and vice versa. Is there any truth in it?"

The past season, drones were killed in early summer, and yet the weather is and has been remarkably mild. The same was true a year ago. The weather at the time, in affecting the harvest, leads to this premature destruction. There is, however, no possible relation between such events and the future. When men knew little of nature they were ripe for such superstitions. With the development of science, such beliefs will become wholly a thing of the past.

A. J. COOK.

Agricultural College, Mich., Jan. 3.

[I want to say amen to Prof. Cook's replies. Our nation is full of rural people, especially those well along in years, who insist that animals have foreknowledge of the weather; and the amount of time spent watching these senseless movements, if turned in the line of scientific investigation, would enrich the world. Let us do away with superstition, and turn our brains to the solution of real problems.]

ARRANGEMENT OF OUT-APIARIES.

DADANT'S SYSTEM ALONG THE MISSISSIPPI RIVER.

Friend Root:—The very interesting article of Mr. France, on out-apiaries, page 883, has induced us to give you our own experience in this matter, not because we can throw any more light on the question, but because our practice, which extends back to 1871, in the matter of out-apiaries, confirms the views of both Mr. France and Dr. Miller, and will add weight to their statements.

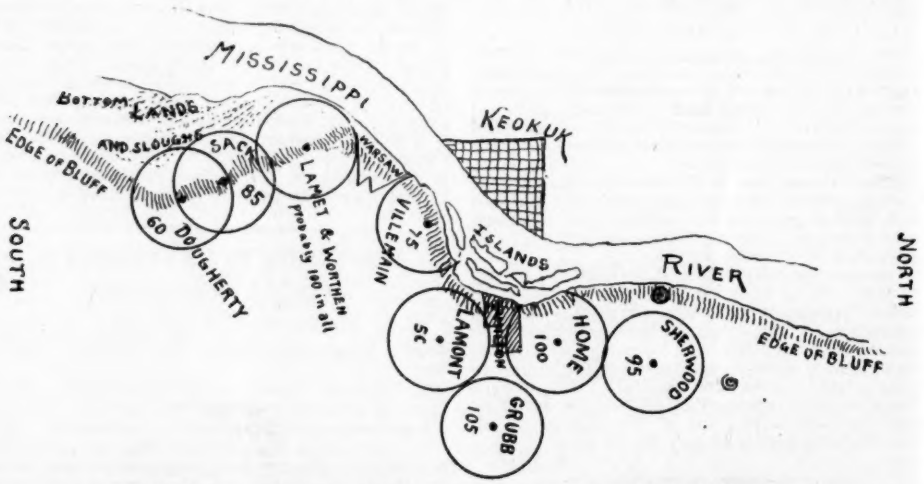
Under ordinary circumstances it is not advisable to place apiaries nearer than four miles apart; but Dr. Miller is undoubtedly right when he says that the configuration of the land has a great deal to do with the greater or lesser distance that the bees will travel in certain directions.

In the accompanying diagram you will perceive that these apiaries are all located on land sloping toward the Mississippi River, and are separated from one another by creeks and groves of timber land. The Grubb apiary is owned by D. W. McDaniel, who has had charge of our apiaries also for a few years past. Of all these apiaries, the Sherwood is the best in the product of both spring and fall crops, although there are seasons like the past when the fall crop fails there altogether.

The Villemain apiary has the poorest location, to all appearances; but it is located near the only basswood grove there is in the country, and has also quite a fall pasture from blossoms that grow on the islands near it. But what will you think of the Sack apiary, which is located a little over two miles south of the Lamet apiary, with another apiary close to the latter, and not shown on the diagram, and only one mile and a quarter north of another apiary of 60 colonies, owned by A. Dougherty? Yet this Sack apiary gives us the best average of honey of all, excepting the Sherwood apiary. The reason of it is, that the pasturage is all west of it on the river bottoms, and very abundant. It is probable that the bees in this apiary go as far west as the river, about three miles, while they perhaps do not travel over a mile east on the bluffs. Their course north and south, in the direction of those other apiaries, is over a hilly country covered more or less with timber, which makes their flight more difficult.

The two small circles in the north part of the diagram show spots on which we have had apiaries formerly, and which, you will perceive, were further away from home than the present. At that time the Sherwood apiary did not exist, nor did the Grubb apiary; and yet we must say that we can see no difference in the yield of the home apiary. We are satisfied that the Grubb bees go east, the Sherwood bees and the home bees northeast, for their crop. When we say the bees go in a certain direction, we do not mean *all* the bees, but the greater part of them. We can give you one convincing instance of the correctness of this opinion.

By glancing at the diagram you will notice that the home apiary is just about a mile and a half from the north point of an island in the river. In certain seasons these islands are covered with water in June; and after the waters recede they become covered with a luxuriant



THE DADANT SYSTEM OF OUT-APIARIES ALONG THE MISSISSIPPI RIVER.

vegetation, and the yield of honey from them is very large. In one of these seasons we found a colony, belonging to a neighbor, located half way between us and the river, harvesting a large yield of honey from this source, while our bees harvested nothing. Is it not evident that our bees had not gone that far? Yet we have seen them two miles and more from home in another direction.

Had we kept as careful records as Mr. France did, we should probably also be able to derive some good lessons from these records; but we are sorry to say, that, although we have harvested enormous crops of honey from our bees, we have been rather careless about keeping a record. If we had things exactly as we ought to have them, in the matter of location, we should spread all the upland apiaries a little more, and place them, say four or five miles apart; but there are lands like those Mississippi bottom-lands which can support apiaries very close to one another, and make money for their owners. C. P. DADANT.

Hamilton, Ill., Dec. 23.

[Thanks. These drawings are exceedingly helpful and valuable. The Sack apiary, in the diagram, is a remarkable illustration of the fact that the lay of the land has sometimes a decided influence upon the bee forage, and that we can not always lay down rules that an apiary should be just exactly three or four miles from each other in all cases. These exceptions are interesting, and there is no way that we can decide where we can locate apiaries profitably except by trial. Of course, we can be guided to a large extent by swamps, ranges of hills, proximity to water, etc. You do not give the size of the circles in miles; but from reading your description I can gather pretty nearly that they are about 2½ miles in diameter. From this the reader can gauge pretty fairly the relative distances. A great many interesting facts are being developed. A. E. Manum has sent in a diagram which we will present to our readers in the next issue.]

THE MICHIGAN STATE CONVENTION AT DETROIT.

HELD JAN. 1 AND 2.

While this convention was not largely attended, those present were perhaps among the best and brightest bee-keepers, not only to be found in Michigan, but I think they compared well in intelligence with any we have in the world. One who is accustomed to attend conventions will very readily pick out those who are in the habit of attending either bee-conventions or conventions of any kind. It seems to be something like this:

The man who has never attended conventions, or who has not done so for a great while, is the more apt to be hasty in coming to conclusions. He is also, as a rule, more ready to think evil. He imagines that the world is full of corruption, and that even bee-keepers are more intent on finding a chance to steal and not get caught than they are to find some way whereby they can be helpful to their fellow-men. The worthy president, Prof. Cook, has, perhaps, done much to bring about this better state of affairs. How natural it sounds, to hear him say, when some absent member is violently attacked, "Oh, no, my friend! If you knew the brother as well as I do, you would not think of charging him with such a thing."

Sometimes, it is true, he is obliged to admit that some brother has done a very foolish and possibly a very wicked thing. In such a case he reproves the guilty one in such a gentle, kindly way, and in a way that stirs him to a tremendous resolution to do better next time, that the spirit is really contagious. Please do not imagine that he ignores and smooths over all the wrongs that exist in society, or in bee culture, if you choose. He will sometimes speak right out in the convention, something like this:

"Now, Bro. ——, since this matter has come up right before us as it has to-day, will you just let me say that I have felt greatly pained, many times, to see you go to such extremes in this direction? Here are all these good friends of yours who disagree with you. Now, will you not, for their sakes, and out of respect to their opinions, withdraw a little from your vehement views, or, at least, put it a *little* milder?"

The kindly look in his face, at the time he speaks, prevents anybody from taking offense; and, in fact, jangles or hard words at bee-conventions are unknown when Prof. Cook is present. During our last convention we discussed many matters where there was pretty strong disagreement; but it was from first to last characterized by a spirit of brotherly love that I am sure every one of us carried home; and I feel, too, that its influence is going to make us better men for a *long time* to come.

DOES IT PAY TO USE SUCH LARGE QUANTITIES OF COMB FOUNDATION?

You will remember that this subject has been up in the bee-journals, and there has been some intimation that editors interested in the sale of the article may, at least unwittingly, have kept purchasers in the dark. Our good friend R. L. Taylor was called upon to open the subject; and by some means it fell upon myself to ask him some questions. I was somewhat surprised, and a good deal amused, to hear him insist so emphatically that we can not afford to have combs built without foundation. He said that, inasmuch as combs would last us a great number of years, the *first cost* is but a small consideration. He would have the sheets fill the frames. When it came to a rising vote, the bee-keepers were almost unanimous in indorsing his view. Foundation for section boxes brought forth much the same decision.

The number present who had out-apiaries showed very conclusively that there is a wide difference in the honey-yield in localities only two or three miles distant. A man may have a good yield of honey, while his neighbor three miles away gets almost nothing. This indicates the importance of testing different points in your locality, say three or four miles away. When you strike a point where bees seem to do best, gradually increase the number of colonies until you ascertain how many can be profitably located at a certain point. This will also help us to avoid the disaster of bad seasons. It is a little on the plan of not putting *all* your eggs in one basket.

ADULTERATED LIQUID HONEY.

It is a sad fact, that there is once more considerable spurious honey offered for sale. Samples were on the table, brought from some of the Detroit groceries. One could readily judge by the taste that both cane sugar and glucose were used in getting up the mixture. It was labeled "Michigan Honey," but, of course, the name and address of the party putting it up were not to be found on the label. This alone is a plain violation of the laws of the State of Michigan; and some of us were vehement in demanding that the guilty parties be prosecuted at once. As friend Taylor, however, sat in a thoughtful attitude with his head down upon his hands, I suggested that we hear from him.

As he did not seem inclined to say any thing, we bantered him somewhat; and in response to a question of mine he said he would cheerfully answer any questions I might wish to ask. Now, as there is much wisdom in his reply, especially as he is a lawyer of experience, and a member of the State Legislature, I will try to give his replies here.

"Friend Taylor, have we not ample proof right here before us, so that it will be an easy matter to bring these guilty parties to justice?"

"Well, the proof is plain enough, friend Root; but I am sorry to say that it will not probably be an easy matter to deal with the offenders. They have plainly violated the laws of Michigan, it is true, in putting honey on the market without the name of the producer, providing we can *prove* that which we all *know* very well—that this honey is not the product of the bees. Unfortunately, our chemists are at fault. Our good worthy president, Prof. Cook, took some honey out of his own hives, at the college apiary, and sent it to Prof. Wiley, at Washington, who pronounced it, after a chemical analysis, *adulterated*."

This raised quite a buzz, and I guess there was some indignation in the buzz. I turned to Prof. Cook, and asked him if it was the same Wiley who started the story about manufactured comb honey. He assented, and then *I* commenced to boil over. Now, here is a sample of Prof. Cook's gentleness, and, I think I may say, wisdom. He replied something as follows:

"Friend Root, Prof. Wiley *has* made some mistakes. It is true, he did pronounce the honey impure that I took from my own hives; but before we condemn him too severely, let us remember that the best chemists we have in the country have made the same blunder. Perhaps we had better acknowledge that chemistry is not to be trusted with absolute certainty at the present time, between manufactured glucose and the glucose, or grape sugar, that is found in flowers. Before we condemn friend Wiley too severely, let us bear in mind that he is an excellent man, and one who has done excellent service in many departments of science for our country."

Friend Taylor added further, that he presumed if we, as a body of bee-keepers, were to take oath that, according to the best of our knowledge and belief, the samples of honey before us were composed largely of cane sugar and glucose, something might be done. The offenders, however, were said to be a rich manufacturing institution, who put up pickles, jellies, and other things, in glass tumblers. One man would stand a rather poor chance in opposing them; and I believe our best advisers incline to the idea that the Bee-keepers' Union had best take the matter in hand.

I tell you, friends, the great reforms of the present day are conducted by those who work slowly and carefully. Instead of boiling over, and condemning those who have capital, as a whole, shall we not bottle our indignation for the present, and —— send Bro. Newman a dollar to make us a member of the Bee-keepers' Union, and let *him* manage these matters?

Now I fear I must direct you to other bee-journals for fuller reports of the proceedings of this convention. For the present I want to tell you about my visit to

D. M. FERRY & CO.'S GREAT SEEDHOUSE, DETROIT, MICH.

I started to get up as usual, somewhere about six o'clock. Somebody in the next room called out to know whether myself and friend Hilton (my room-mate) were starting out for greenhouses. I answered eagerly, "Why, to be sure, we are. Get on your duds quick, and go with us."

"But, may be when you find out who it is you won't want him along."

"Yes, I do want you to go along. There is not anybody in the world, who wants to go, whom I do *not* want to go along."

After I had said this I began wondering whether I told the truth. Oh how glad I felt, as I searched my heart, that I had told the full plain truth! If I *have* an enemy in the world, he is just the man I should like to take by the hand and show him the greenhouses in the early morning. (Yes, I should rejoice to take, on such a trip, even our poor mistaken friend Hill, of the *Bee-keepers' Guide*, who has labored so long and hard to hold up before the world both my fancied and real weaknesses and imperfections.) I thought the voices in the next room sounded somewhat familiar, but I could not quite make them out, and they had a good deal of merriment at my expense. Well, they were no other than two of my best friends, M. H. Hunt and R. F. Holtermann. It was friend Hunt who suggested going to Ferry's new seed-house instead of to the greenhouses. I owe him a big debt of gratitude for a lot of other similar deeds of kindness.

This wonderful structure has been built only about two years, on the site of the one previously burned. It is 300 feet long and 120 feet wide, and has between *seven and eight acres* of floor space. Now, when I tell you that it is seven stories high, and every floor occupied, you may wonder as I did, that so little has been said about such a tremendous enterprise. Like our own establishment, this one is, a great part of it, in charge of women. A woman gave us a permit to go through the rooms. Crowds of bright, intelligent-looking women, passed up the stairs with us, put their cloaks and hats nicely away in cupboards made especially for them (a separate cupboard for each cloak), and then took their places in the handsome offices that filled a part of one of the great rooms. These offices are finished off in the handsomest style of present office architecture, and it was a great study for me. Decorated wire cloth separates the clerks from each other, so each one has really a little room of his own, as it were, where they can not be annoyed by visitors or by each other. The bins, drawers, pigeon-holes, and other arrangements for the rapid classifying and mailing of seeds, showed wonderful skill and ingenuity; and, further on, the rapid movements of the girls as they took up their work put to shame any sleight-of-hand performance I ever saw. One of the girls worked so rapidly in pasting up packets of the seeds that I asked her to please go slow enough so I could see what she was doing. She smiled as she did so. The paste they use is about the consistency of butter, only not quite the color. A little bit is taken on the end of the finger. In their rapid movements this finger is stuck straight out when not needed, so as to be out of the way; and one is astonished to see that the paste gets just where it is wanted, and nowhere else. At another table dozens of girls were dipping up seeds with teaspoons, and putting them into the open mouths of printed packets. It looked for all the world like feeding ducks with a spoon. Each duck, however, got only one spoonful. A man sat at a raised desk in the center of the room. By the way, where there are so many hundreds of young people, it is not any wonder that an elderly one is needed for a boss. A good many of the young eyes sparkled with fun and mischief, especially if they could catch sight of any glimpse of a smile lurking around the corners of the mouths of the visitors. And I tell you, there does not want to be very much fun or "cutting up" when you are putting up seeds. Remember what I

said about 20 cents' worth of cabbage seed, on another page. There are between 800 and 900 people employed in this one building. They have the same Grinnell system of sprinklers we have. The rooms are warmed by steam, as ours are, and lighted by 1000 incandescent lamps. Surplus seeds are stacked, tons upon tons, in bags piled up in neat square tidy piles. I wondered whether rats and mice ever found a harboring-place in this immense institution. My keen olfactories did not advise me of the proximity of any of these mischievous rodents.

Ferry's specialty is, as you may know, furnishing the groceries and country stores of the United States, and perhaps the world, with garden-seeds. In order to do this the boxes are sent out on commission, and called in before Jan. 1. Our visit was just in the nick of time. Their plan of giving their customers the best seeds is something like the one I have indicated elsewhere. Old seeds are not *always* inferior. But they protect their reputation by a careful testing, winter and summer. I was pleased to notice how they manage to keep their seed-cases clean and bright, after taking their chances in transportation, and being kept during spring and summer in the average show window of the village store. Their boxes and cases are all dovetailed, like the Dovetailed hive. The bottoms are put on with a nailing-machine, or with screws. These latter are also driven home with machinery. All nails and screws are sunk below the surface of the wood; then when the box comes back it can be run through a suitable planer or sandpapering-machine, and made new all over quicker than you could wash it all off with brush and soapsuds. New labels are then put on; new seeds (or old ones that stood satisfactorily the test) are then put in new packets, and the cases filled up with such an assortment as the great world demands, and sent off to do duty. Now, do not find fault, or complain of sending seeds out on commission. If they did not do their business honestly and well, they would never have built up such an immense institution. If nearly 1000 are employed in this building, how many people do you suppose D. M. Ferry & Co. keep at work during the summer time? Here we have illustrated the wonderful way in which nice work and accurate work can be done at a comparatively small expense. Those girls could never acquire that wonderful swiftness did they not put up thousands upon thousands of packages; neither could the other enormous machinery of such a business be used with so little expense in any other way. I should like to tell you more, but space forbids, just at this time.

OUR QUESTION-BOX,

With Replies from our best Authorities on Bees.

QUESTION 176. *Do you think bee-keepers have secured any advantage from the Government Experiment Station? 2. Is it desirable to make any effort to induce the government to do any thing more for our industry?*

No.
Ohio. N. W. H. R. BOARDMAN.

1. Yes; every *little* helps. 2. Yes.
Vermont. N. W. A. E. MANUM.

1. Very little. 2. Remove the custom duty on beeswax.
Illinois. N. W. DADANT & SON.

No, not as a general thing. 2. The Lord helps those who help themselves.
Illinois. N. W. C. MRS. L. HARRISON.

1. Perhaps a little. 2. I think the advantages are not enough to make the effort desirable.
New York. C. G. M. DOOLITTLE.

I don't know what they have done or what they will be likely to do.
Wisconsin. S. W. E. FRANCE.

I do not know of any important advantage gained. 2. Not until we clearly see some advantage ahead which the government could readily secure for us.
Ohio. N. W. E. E. HASTY.

I should suppose very little. Only one or two stations are doing any thing with bees, and two seasons are too few to secure any important results. Yes, every State should work to aid bee-keepers.
Michigan. C. A. J. COOK.

No. 2. Yes, I think it is. In Canada their societies have aid from government, and horticultural societies are helped by our State. Experiment stations are of immense value in other departments—why not in bee-keeping?
Illinois. N. C. C. MILLER.

Yes; the experiments to test whether bees will puncture sound grapes was a good move in the right direction, and ought to remove much prejudice. 2. Most certainly, get the government to do all it will for us. There is not much danger of our getting *too* much.
Wisconsin. S. W. S. I. FREEBORN.

Prof. Cook has been much more valuable to our specialty than the experimental station, but it was a good "backer." 2. Yes, if the work can be put in first-class hands. A thorough, practical, and scientific bee-keeper should have charge of such work.
Ohio. N. W. A. B. MASON.

Yes. The government analysis of honey shows us that some of the best chemists are not able to recognize pure honey. 2. If you have any surplus energy you want to work off, here is a chance. You will probably earn more than you get.
New York. C. P. H. ELWOOD.

I think not. 2. The less the government has to do with our industry, the better off we are. The more we induce, the more lies we stir up. Smart professors and clerks imagine wonderful things when bees are mentioned to them, and something funny must be said about the "busy bee." The government is doing very well by us now. Let us let well enough alone.
New York. E. RAMBLER.

I have not seen any yet; have you? 2. I think likely, if it were done in the right way, but I doubt whether it can be. The first thing the government will do will be to place it in the hands of somebody who does not know any thing about practical apiculture, and who, either through favoritism or ignorance, will place it in the hands of one just as ignorant as he is. That is all it will ever amount to, I guess.
Michigan. S. W. JAMES HEDDON.

Perhaps; as, for instance, from the report of experiments on bees vs. grapes. The position gives authority, in the minds of many people, to statements which, coming from a more careful experimenter in another position, would not have so much weight. They have also received

harm from it, as, for instance, in the "sure cure" for foul brood emanating therefrom. 2. Yes, the right man might do a great deal of good.

Illinois. N. C. J. A. GREEN.

[I suppose the question has no reference to any reflection on our experiment stations that belong to the different States, for these have certainly given us some great helps; and I heartily indorse Prof. Cook's position, that every Stat should help its bee-keepers. I believe the Government Experimen: Station will doubtless do much for all our industries.]

HEADS OF GRAIN

FROM DIFFERENT FIELDS.

BUYING AND SELLING HONEY; GRADING A NECESSITY.

Allow me to extend my sympathy. Your troubles in regard to buying and selling honey are the common troubles of all bee-keepers. I would suggest, as a remedy, that all honey be graded as other products are; and I think that, if A. I. Root or some other prominent bee-keeper would bring it up at the convention at Albany, something could be done. I would suggest, as a starting-point, something like the following grades:

No. 1. Extra pure white, in No. 1 sections or cartons, no candied honey, capping free from stains.

No. 2. Pure white; slightly stained cappings should be admitted to this grade.

No. 3. Slightly shaded and stained honey not good enough for No. 1.

No. 4. Dark honey, partly filled sections, and badly stained.

No. 5. Leaky sections, wormy and broken.

Extracted honey could be graded in about the same way. These grades could be printed on slips; and bee-keepers could inclose one to their customers, when shipping, and so establish a uniform grade to buy and sell by.

Saratoga, Wis., Dec. 7. THOMAS ELLIOTT.

[You are right. If honey were properly and *honestly* graded and honestly named it would do away with half the trouble in buying and selling. When a buyer receives honey of a poorer quality than he *expected*, he has some grounds for complaints. Bee-keepers are disposed to be honest; but a little self-interest (the kind that puts the best out) sometimes slips in. Carelessness in grading, or, what is worse, no grading at all, meets its reward, and a mighty poor reward it is sometimes. Those producers, as, for instance, Manum, Crane, and a good many others, who grade their honey, get a good price.]

NAMELESS BEE-DISEASE NOT CURED BY REMOVAL OF THE QUEEN.

I agree with friend Doolittle, in what he states in GLEANINGS, Dec. 1, page 855, of the nameless disease. I have removed the queen several times through the summer, and it did no good. Those that were badly affected with it last summer, 1889, showed no signs of the disease after cold weather, nor did they show any signs of it until hot weather came in earnest; then the disease broke out again in some of those that were affected last year, but not all, but started in some healthy ones, and kept with them until freezing weather came; but I have not seen any signs of it since, although the bees have been flying freely. I believe yet, that honey taken by robber bees from colonies affected by said disease will carry it home, and soon it will break out in their hive. At any rate, it has with me. I expect to try taking all the combs of honey away from the colony so affected next year, and give them empty combs, and see if that will cure it. I have tried taking away queens, and failed nearly every time.

JOSIAH EASTBURN.

Fallsington, Pa., Dec. 22, 1890.

[Friend E., this matter came up at our recent Detroit convention. Almost every one present claimed that changing the queen was a perfect cure; and Prof. Cook said he had recommended this remedy to great numbers, and had never yet heard of a failure. If the disease you have is carried from one hive to another, as you describe, I think it must be something else.]

THE THEORY AND PRACTICE OF BOTTOM VENTILATION IN HIVES.

Will my bees winter in dry cellar with permanent bottom-boards on, with top ventilation? My bottoms are all fastened, and I have a gable roof with a ¾-inch hole at each end, with a piece of burlap over the brood-nest. I have only ten swarms. Why is it necessary to have the bottom open? HIRAM B. WINSLOW.

Mahopac, N. Y., Dec. 8.

[Your bees may winter with the top open, but the tendency of the times is emphatically against top ventilation of the hive in the cellar. It should come from the bottom, either through a good-sized entrance kept cleared of dead bees, or, better, from the whole lower part of the hive, the bottom-board being removed. The reason is this: If the top is open, all the heat rises and escapes. On the other hand, if the top is closed the heat rises and is confined near the top, and the surplus, if any, "overflows" at the bottom. Bees need plenty of ventilation in the hive, but they must not have it at the expense of heat.]

THOSE REGISTER-BOARDS OF MUTH-RASMUSSEN'S, AGAIN.

In your foot-note to my article, page 850, you propose printing numbers on the date-cards, running from 1 to 100. I must strongly object to this. How many bee-keepers have exactly 100 colonies? If one buys a package of 100 numbered date cards, but has less than that number of colonies, what is he going to do with the rest of the cards? Or if his number of colonies exceeds 100, what then? No; please leave the place for the number blank, and let the purchaser himself write the number as it may be wanted. Print the cards just as the sample, only *make the date figures as large as possible*, and I am sure it will be thus most satisfactory. The cards might be (for convenience) put up in bundles of 25, like postal cards. When you get them printed, send me 200 cards, without further order. As apiaries and millinery stores are not always close neighbors, I would suggest that you, for the accommodation of your customers, obtain and keep for sale suitable black pins for these cards.

WM. MUTH-RASMUSSEN.

Independence, Cal., Dec. 9.

MRS. L. HARRISON INDORSES THE STRAWBERRY-BOOK.

I was slightly ill of late; and, casting about for something to alleviate my aches and pains, my eye fell upon your strawberry-book; presto! they were soon forgotten. How I dug, raked, and planted, and delighted in seeing them bud and blossom, and gathered the luscious fruit! It is a grand panacea for an invalid. Let him have a small strawberry-bed, and he will soon

take a new lease of life. If he can not walk, roll him out in a wheel-chair and put a light tool in his hands. If he can not dig and plant, do this for him, and let him cultivate them. The blood will soon be bounding through his veins, and he will be a boy again.

Peoria, Ill., Dec. 5. MRS. L. HARRISON.

OUR HOMES.

But one thing is needful; and Mary hath chosen that good part, which shall not be taken away from her.—LUKE 10:42.

Bunyan, in the Pilgrim's Progress, gives us a picture which he calls "The Man with the Muck-rake." A poor, needy old man, poorly clothed, and bent with age, stands stooping over with a poor, miserable, rickety rake, with which he continues to pull up toward him the straws and the leaves, and the dust and the rubbish; and while he is thus busily engaged, an angel of light holds above his head a celestial crown. The old man, however, is too busy with his sticks and straws to pay any attention to the celestial crown; in fact, he won't even look up toward it. He is too busy. The straws and the sticks, the dust and the rubbish, are of too much importance, in his poor feeble judgment, to take the time to cast even one glimpse toward the crown of gold. The angel even tries to make a trade with the poor old man, and offers to swap the crown of gold, "even up," for the poor, miserable, dilapidated old rake. But the man stubbornly refuses to trade. Did you ever think, my friend, what a wonderful illustration that is? I hardly need tell you that the man with the muck-rake is ourselves—you and I—and our neighbors. Bunyan, by his figure, means to remind us that there is a shining crown just above our heads, and that it is held there by an angel of light. This angel is pleading for attention. He is calling us to look up from our busy cares, and to see the golden crown. I wish I could look into the faces of the readers of GLEANINGS this new year, and see how they receive the picture I have tried to place before them. Some of them, I know, will say it is true; others will admit that it is a very pretty fable, but will rather conclude that it is *mostly* fable. Still others, who are dissatisfied and disgusted with the straws and leaves—yes, and perhaps with the miserable old muck-rake too—will admit the fore part of the illustration, but will deny that there is a crown—a celestial crown, for each one of us; and I am afraid that we are all, in fact, more or less lacking in faith in regard to the crown of glory that awaits us. The question is, "Is Bunyan's figure a truthful one?" Is it too extravagant? Is it real? Let us turn to God's holy word, and see what authority good old John Bunyan had for his wonderful figure. He was a student of the Bible, and his wonderful illustrations came right home from the Bible itself. In fact, he had nothing to work with except the word of God, and the inspiration of God's Holy Spirit. May that Holy Spirit be with you, friends, in my talk to you this morning, and enable me to unfold the Bible promises in this very line.

We will first turn to Proverbs, fourth chapter, where it speaks of Wisdom. We read: "She shall give to thy head an ornament of grace; a *crown of glory* shall she deliver to thee." These are the words of Solomon. He knew what it was to wear a crown. He had wisdom beyond the average of humanity, and he says that this wisdom shall give us an ornament of grace—an ornament for the head, mind you. We like to see grand men and beautiful women. It is the duty of all of us to look well before our friends. Our wives and daughters give considerable attention to ornaments, especially for the head; and they do well, providing they forget not this ornament of grace which Wisdom gives. Wisdom is used in the Bible sense as the opposite of folly. One who listens to Satan, and gives way to temptation, has forgotten wisdom. Wisdom directs us to be pure in heart; and it also directs us to seek first the kingdom of God and his righteousness, and promises that the sticks and straws, and the things that we need, shall be added; and the Bible promise goes further, and says, "A crown of glory shall she deliver unto thee."

Let us now turn to first Corinthians, 9th chapter. Paul, in exhorting us to godliness, uses the figure of the races, and says, "Know ye not that they which run in a race run all? but one receiveth the prize." You see, they had prizes in those days, as they do now. In their contests of skill and physical strength, but one received the prize. It is not so in God's service, however. There are crowns enough for all, and there is no partiality and no respecting of persons. Paul continues: "So run that ye may obtain; and every man that striveth for the mastery is temperate in all things." In those days, as well as now, they had discovered that a man must be temperate to obtain a prize in a physical contest. No drinking man can expect to excel. Now comes the point of our lesson:

"Now, they do it to obtain a *corruptible* crown; but we an *incorruptible*." Paul tells us that the crown held out to us by the angel of light is an incorruptible one, "which fadeth not away."

Let us now turn to James, first chapter. We read: "Blessed is the man that endureth temptation; for when he is tried, he shall receive a crown of life, which the Lord hath promised to them that love him." Bunyan calls it a celestial crown. In the text above it is called a crown of life. It also tells us that it is given to the one that endureth temptation; and it comes, too, when he is tried. We sometimes think it is hard to meet trials. Some of us have prayed, perhaps, that God would remove these temptations that beset us and pester us continually. Our last text, however, seems to indicate that it is a good thing to be tested and tried. In fact, we could not have a crown of life otherwise. I sometimes think that it can not be possible that others are called upon to meet temptation so continually as I am. As I look out upon the world, it seems to me that nobody ever had such terribly hard work in trying to be good as I have had. I once heard a minister of the gospel say in his sermon that Satan himself, the *prince* of the powers of darkness, could be in only one place at the same time. I was tempted to question this theology. Very likely the preacher gave it as his own opinion, in an off-hand sort of way. Why could I not accept such a doctrine? Well, it did not seem to be possible that the prince of evil should leave all mankind, and turn so much of his attention to my poor self; and then came a helping thought: If it were true, I might feel glad that the rest of humanity had a respité a good deal of the time.

I used to think that Revelation was a dry book; but of late I have learned to turn to it and get much comfort and consolation. Especially do I like that second chapter that has so many promises to him that overcometh. For instance: "He that overcometh and keepeth my works to the end, to him will I give power over the nations." And again: "To him that overcometh will I give to eat of the hidden manna, and I will give him a white stone, and in the stone a new name written which no man

knoweth save him that receiveth it." Well, in that same chapter, about the middle, we read: "Be thou faithful unto death, and I will give thee a crown of life." You see this crown is promised to those who are faithful. It is not enough that we be faithful a little while; we want to be faithful unto death, and then have we the promise of a crown of life. Did our friend Bunyan put it too strongly? Let us turn to First Peter, fifth chapter: "And when the chief Shepherd shall appear, ye shall receive a crown of glory that fadeth not away." By reading the first part of the chapter we find this wonderful promise is to those who "feed the flock of God, not by constraint, but willingly; not for filthy lucre, but of a ready mind." The promise of a crown of glory is to those who are trying to make the world better; who "rejoice not in iniquity;" who "think no evil." Further along we read, "Be sober; be vigilant; for your adversary the Devil as a roaring lion walketh about, seeking whom he may devour."

The "adversary" will most surely entrap you into wasting the precious moments in fussing with straws, leaves, and the dust of the earth, if he can do so. He will leave no stone unturned in his schemes to get you to look *down* and not *up*, if it can be done. If your face, like that of the man in the fable, looks constantly downward toward the earth, you will never see the shining crown nor hear the angel voices.

Now, my friends, during this coming new year let us see to it that we look out for him who comes "as a roaring lion." Did you ever feel yourself in a bright, cheerful mood, ready to work for the good of humanity, ready to listen for the angel voices, when all of a sudden something drove out the good spirit and pulled you down to earth? Perhaps it was some little trouble with a neighbor. May be he borrowed something and did not return it. May be he showed a greedy, overbearing, and unfeeling spirit. Away go thoughts of union meetings, good resolutions to keep bright and hopeful, and, before you know it, you are led away, down amid the rubbish once more. I know what it is, dear friends. I have wondered whether there were anybody else who felt the truth of two lines in one of good old Dr. Watts' hymns as I have felt them—

> Prone to wander—Lord, I feel it;
> Prone to leave the Lord I love.

At such a time it does me good to repeat mentally, "Wherefore do you spend money for that which is not bread, and your labor for that which satisfieth not?" I say to myself, "Well, how is it, old fellow? Is this thing that is just now stirring you up, and that seems to demand your immediate attention, whether any thing else is attended to or not—is *that* the 'bread' that the prophet Isaiah speaks of? and is it the kind of labor that '*satisfieth*'?" Sometimes I think for a while it is; but after a few hours have passed by, when the turbulent sea of my turbulent nature has calmed down, then I think, with oh so much remorse and regret! "No, no; it does *not* satisfy." There is only one thing in this whole wide universe that does satisfy, and that is told in our opening text. "Mary hath chosen that good part which shall not be taken away from her."

Now, to wind up my short Home talk to-day I want to turn to Paul's second letter to Timothy. The veteran saint says, when near his end, "I have fought a good fight, I have finished my course; I have kept the faith." Has any one lived since the time of Paul who could consistently take such words upon his lips? And then he adds: "Henceforth there is laid up for me a *crown of righteousness*, which the Lord the righteous judge shall give me at that day; *and not to me only, but unto all them also that love his appearing.*"

SPECIAL DEPARTMENT FOR A. I. ROOT, AND HIS FRIENDS WHO LOVE TO RAISE CROPS.

STARTING ONIONS IN THE GREENHOUSE.

We first commenced this in 1886. Landreth's people had an onion called the Bloomsdale Pearl, which they said was specially adapted to the South. I was so anxious to see some of them that we sowed them in the greenhouse some time in January. We had beautiful pearly-white onions long before any were seen in the markets. They sold so readily we let them all go when they were about the size of hens' eggs. Next year we planted more, and some of them got so large that we sold them by the pound for 10 cts. apiece. Finally our Experiment Station at Columbus took hold of it, and last season they tested almost all the new large foreign onions offered in the catalogues. Like myself, they decided it was a wonderful success. The point is something like this: With ground very mellow, enriched, and brought up to its highest state of fertility, it is exceedingly important that we have a full even stand of any kind of crop. Now, it is very hard to manage this where we depend on sowing the seed and thinning out. By transplanting you can have exactly as many onions as you need on the ground, and no more; and it can be done cheaper than to sow the seed. *Secondly*, where you sow the seed and weed by hand (for weeds will grow as fast or a little faster than onions), there is an immense amount of labor involved. If there were no little onions mixed in with the weeds, we could with the rake, or by horse power, destroy as many weeds in an hour as we can pull out from between the onions in a whole day, or may be several days. By the transplanting process this may be done as follows: Work the ground up nicely, and let it stand until the weeds germinate. Just before you set out your plants, rake the whole surface thoroughly, so as to kill every weed. Now plant your big onions—that is, onions that have passed the weedy stage. They may have bulbs the size of beans, and be perhaps from 3 to 5 inches high. Stretch a string over your fine mellow ground—or, better still, a clothes-line. Run a roller over the line, so it will make the cord leave its print in the soft soil. Now make holes two or three inches apart along this line, and put in your onions. For making the holes, we take a hoe that has been broken from the handle, or, rather, we take the handle part with the shank attached. We grind this shank to a sharp point, and then we have a dibble that can be used standing up. A man can make holes with it on the mark almost as fast as he can walk. A boy goes over with a basket of onions, and puts an onion in each hole.

Onions are so easy to transplant that they will grow almost any way. They should be taken up from the greenhouse or seed-bed, as we do cabbage, celery, and tomato plants. Saturate the ground with water, and dig out the onions with a fork so as to get every one of the fine fibrous roots. We have done transplanting with only *small* boys, and had every onion grow. In fact, the boys get along so fast that they have the ground all covered before I know it. You can plant these onions even quicker than you can plant sets. Of course, you want nice onion ground—soft, mellow, and rich. I do not know how many onions can be grown on an acre. Our Experiment Station suggests that, with these large varieties, you may get over 1000 bushels. Our friend "Joseph," who writes for many of the agricultural papers, has been working in the same line.

Be careful about planting *many* of the large

foreign onions, for they are not suitable for keeping; and with much wet weather they may rot on your hands, or even while in the ground. Our Experiment Station gives the preference to the Spanish King, or Prize-taker, onion. These will grow as large as the onions that are imported in fancy crates.

I notice in the agricultural papers there have been several claims as to the originator of this new method of raising onions. Like most of these new (?) things, however, it often transpires they are not new at all. The *Ohio Farmer* gives an article from some one who has been for many years doing this same thing by starting onion seed in an ordinary hot-bed.

If you are going into the business you had better arrange to commence *selling* the onions as soon as you can pick out one here and there the size of a hen's egg. Peel them, cut off the roots, tie them in neat bunches, and deliver them around to the houses before they have a chance to get dry. If you get them real early you can commence by putting only half a pound in a bunch. In almost any neighborhood they will go off at a nickel a bunch—that is, if nobody is ahead of you. When they begin to go slow, give three-fourths, and then a whole pound for a nickel; and finally, if you get a nickel for a 2-lb. bunch you are not doing a very bad business, especially if you have a yield of any thing like a thousand bushels per acre. Such onions will sell almost every month in the year. The Experiment Station has tested this plan for raising ordinary onions, to be sold by the bushel or barrel in the dry state, and think it a success. You can have your rows absolutely straight, and you can have just enough onions in your row without any thinning, and you get rid entirely of *hand-weeding* I am inclined to think they are right about it. It will, however, necessitate some sort of hot-beds, cold-frames, or greenhouses; and if you are going to use the onions green, you ought to be near a town or city.

HOW TO BE SURE OF GOOD SEEDS.

When our good friend Landreth inaugurated the plan of cremation, or burning up all the seeds before the 1st of January, I thought it was going to be a wonderful advance; but I have changed my mind somewhat. There are a few sorts of seeds that had better be burned up—parsnip, salsify, and perhaps onion. All the rest are nearly if not quite as good for another year. Instead of burning up the onion, however, I would use them to raise onion-sets, or sow them thick in the greenhouse, as mentioned above. We have sowed onion seed two years old for several years, for the above purposes. I have been surprised to find that, many times, they grew just about as well as new seed. Parsnip seed you can not use in this way. Beans and corn rarely germinate as fully when two years old; but by sowing them thicker you may get a very tolerable stand. There is a difficulty, however. If they should *all* happen to grow, we should have to thin them out; and thinning out corn where it is a good deal too thick is very expensive business. In fact, I have found it to take more time than all the hoeing and cultivating. On the other hand, if only *half* the seeds grow, and we have many vacancies, that is bad. It is true, we can plant in some more; but if you do this, unless you have very careful hands to gather your ears for market they will be all the while giving customers some that is too hard or some that is not mature enough. By the way, I have practiced transplanting corn, and have sometimes thought that, for *extra early* corn, it paid very well. You can get rid of the weeds, get rid of the frosts, and get a *perfect stand*.

Now, then, I want to say something in favor of *old* seeds. Almost every season we have more or less seed that pleases better than any other we ever had before. We had the finest White Plume celery this last season that I ever saw or heard of. The seed was purchased of Livingston, of Columbus. I almost quarreled with him because he charged me so much. I even talked of sending it back. When he assured me, however, that the seed was *extra*, I consented to keep it. Well, we have now about 4 lbs. of that seed left. What do you suppose I would take for it? Why, I should hate to sell it for *twice* the regular price, and take my chances on something I had not tested. Peter Henderson said, a good many years ago, that he did not dare to offer celery seed for sale until he had first tested it *one season*, and I am beginning to agree with him exactly. Some years ago we were greatly pleased with a nice lot of White Egg turnips. I bought a bagful of the seed, and put it in our catalogue. We sold it three years. But our turnips were always bad shaped, tough, and stringy. I kept trying these on different land, thinking the soil was not suitable. Last fall, however, we sent to *Livingston* for some White Egg turnip seed, and were rejoiced to find beautiful bulbs, tender and sweet. In fact, they were sweeter than the Purple-top Globe. But right here comes in another trouble. These last were sown on that beautiful piece of ground where I turned under the Sharpless strawberries (and put on so many ashes)—the ground that gave such beautiful radishes in just thirty days. Now, I did not sow *any* of my old White Egg turnip seed on this nice ground. I became disgusted, and tried only the new. So you see we are all at sea. I do know this, however, that Livingston's seed is *good* with *nice ground*.

Under the circumstances I do not dare to use the old seed again until I have tried a row *side by side* with the new. I have been afraid that some of our large seedsmen (especially where they offer seeds at a very low price) save their seed indiscriminately from every plant that produces seed. Suppose they should save seed from a turnip that produced scarcely any bulb at all; or from radishes that just ran up to seed the first thing they did. Last season we sowed a lot of carrots very early. Well, in the fall a great lot of them ran up to seed. Our celery does this more or less every season. Suppose somebody should save seed and offer it for sale, from celery that shot right up to a seed-stalk the first thing. I do not know *positively*, but I presume such seed would not be worth much if any thing. We want to be slow, however, in drawing conclusions. I will tell you why. I once condemned some radishes because they all ran up to seed without making any bulbs at all. I called the seed-grower a *fraud*. Well, I was so much disgusted that I let them go and ripen their pods. The seed fell out and dropped on the ground, during the cool fall weather, which seemed to be just suitable, and brought forth a great quantity of most beautiful radishes. I judged it was the dry hot weather that made the radishes behave so badly in the spring, and that it was the cool fall weather that made the seed from these same radishes do so nicely afterward. Still, it will surely pay to be very careful about the seeds you sow. Let me give you an illustration.

About the first of June we received an order for 20 cents' worth of Fottler's Brunswick cabbage seed. Our friend sowed the seed, and I guess about every one grew. He put out the plants and raised a fine field of cabbages. He says, however, that the cabbages made nice hard heads of *Jersey Wakefield*. He wanted large cabbages to put away for winter. Nobody

wanted these little ones in the fall, so he fed them to his cows, and they were probably worth $5.00 to him. Had they been the real Fottler's Brunswick, he would probably have received $25.00 or $30.00 for them. I think his estimate of only $5.00 on a fine crop of Jersey Wakefield cabbage, even in the fall, was very low, for we often raise them for winter cabbages, and never had any to keep better, or give better satisfaction to our customers. But, of course, we did not get as many pounds of cabbage to the acre. Did our clerk really make a mistake and go to the wrong bag? Well, *she* thinks it next to impossible, and I do not see how it *is* possible. An ounce of seed costs just 20 cents, and the ounce packages are all put up, a lot of them at once. What is to be done? Candidly, I do not know. If I am to pay $25.00 damages to a man who bought only 20 cents' worth of seed, I think I should prefer to give up the seed business entirely. I would buy seeds to plant, of course, but I should be afraid to offer seeds for sale. I mention this little incident to illustrate why it is that most seedsmen decline to be responsible for the crop. If it were possible that a peculiar state of the soil and weather should make Fottler's Brunswick look like Jersey Wakefield, I should say this was the explanation of it. I have not had experience enough to know.

OUR LIST OF SEEDS FOR 1891.

You will remember how determined I was to cut the list down. Well, I have cut it down some. I have cut off all our long string of tomatoes but three, and some other things in proportion. But the correspondence that was brought out in regard to the subject rather discouraged me. For instance, I was going to drop Louisville Drumhead cabbage; but this brought a wail from a good friend who had been buying of us for years, who said there was nothing like it for his locality. Last season we tried dropping Early Summer, in order to get rid of so many varieties; but we had more Early Summer plants ordered than almost any other kind. The biggest and finest cabbages on our grounds were from a few Early Summer plants left over after filling orders. They looked so fine that we just put in a couple of rows, and so it has transpired with other things. We also dropped the White Egg turnip in our 1890 catalogue; but the White Egg was, during this past season, called for all over town, and was the best early turnip we ever raised. Our Experiment Stations have certainly done a very wonderful work in weeding out duplicates. Friend Green, in this issue, says that Shoepeg corn is the same thing as Ne Plus Ultra and Banana; and we had some on our grounds that was called, I think, Sugar Cream.* We compared it in looks, and put it on the table, and it was so near like Shoepeg that certainly there is no reason for cataloguing the two under different names. This makes *five* different names for one kind of sweet corn.

The Osage melon was introduced with quite a flourish, and it is really worthy of adoption; but it is now pronounced the same thing as Miller's Cream, which came with an equally great flourish, and some of the catalogues have described both without any intimation that they are even alike.

Where are we going to get our seeds the coming season? Well, this also becomes complicated and complex. It would save us a good deal in freight and express if we could buy all or nearly all of one seedsman; but we can't do it. As I get acquainted with our various seedsmen, I rejoice to see that they are, for the greater part, good, honest, faithful, hard-working men. We find excellent reasons for getting a certain line of one man and a certain line of another, and so on. There are certain seeds we greatly prefer to raise ourselves. Others come from men who, we know by past experience, raise exactly what we want. Some might happen to come from one and some from another. If you wish to intrust your orders to me, I will do the very best I can for you; but I can not, under any consideration, undertake to guarantee that the seeds we furnish will *always* give a crop.

*Burpee's catalogue is just at hand, and he gives *still another* name to the Shoepeg; namely, Quaker Sweet. He also pronounces the much-lauded Polaris potato the same thing as the Puritan—*whew!*

RAISING LETTUCE IN A GREENHOUSE, AND THE LETTUCE DISEASE.

I built a small greenhouse, 11½x48 feet, last fall, to grow lettuce in, but my first crop is nearly all gone by damping off. I understood that the Grand Rapids lettuce was proof against that fault. There must be something wrong with the treatment I give them. What do you suppose is the matter? JNO. MAJOR.

Cokeville, Pa., Dec. 24.

[Friend M., for several years back there has been universal trouble in raising lettuce in greenhouses, in just the line you mention. But the Grand Rapids lettuce is so little affected in this way that it has been called rot-proof. My opinion is, that it is mainly caused by imperfect drainage, and too much dampness in the atmosphere. The trouble occurs mostly in December or January, when we have the least sunshine. Sudden drafts of chilly air also—at least at times—have something to do with it. Opening the ventilators so that frosty air may strike directly on the plants will cause them to begin to damp off, say the next day or two, or three days afterward. Taking the sash off entirely when we have a spell of warm weather seems to do the plants a great deal of good. One kind of dampening off is often caused, evidently, by having the plants too close together—say where they are crowded in the seed-bed. I have had the opinion that plenty of air, so as to dry the plants and the soil out, just as they will get dried out between showers outdoors in summer, might remedy it, and I have wondered whether warming the greenhouse by a blast of heated air might not help to get rid of dampness in the winter time. Now, if some of the veterans in growing winter lettuce will tell us more about it, I shall be glad to give them space. When I last visited Peter Henderson he said his neighbor John Hudson, who built six large greenhouses, mostly for lettuce-growing, had been obliged to give it up on account of the dampening-off and rot. He could grow radishes, without any trouble; but he could get lettuce only by making hot-beds in the old-fashioned way, in the open air, stripping off sash to give them sun and rain when the weather permitted. You can get a glimpse from the above of what I expect to do with my new-fashioned greenhouse when I get it figured out. I have already ever so many plans, but they cost too much money for the ordinary market-gardener.]

WHAT IS THE CAUSE OR ORIGIN OF A "SPORT" IN VEGETABLES?

For the last five years I planted but one kind of pumpkin. In 1889 one vine had an entirely different kind from the parent stock, and, being better, I saved seed from the best one to plant in 1890. This year I had at least six or seven distinct varieties from the seed of that one pumpkin, and only one vine from 80 or 90 had fruit like the one saved from. If I plant seed

from only one kind the coming season, will it be the same, or go on increasing? Was it a sport or not? I thought they produced the same as the sport. I have some of them yet, just as sound as when picked from the vines. They are a sweet pumpkin. BENJ. PASSAGE.

Stark, Mich., Dec. 25.

[Friend P., you have struck upon something of great interest to me, and perhaps to others. You can, without question, by careful selection, get a distinct variety of pumpkins from the sport you mention; but, if I am correct, a sport is always inclined, more or less, to sport still further; therefore your pumpkins will sport still further unless you by selection hold them down, as it were, to something you have decided on. I wish Prof. Cook would tell me whether I am correct.]

EDITORIAL.

Wherefore do ye spend money for that which is not bread? and your labor for that which satisfieth not?—ISAIAH 55:2.

REDUCED rates to the Ohio State Bee-keepers' Association (to be held at Toledo, Feb. 10 and 11), will be given on all the roads—at least 1⅓ fare, and possibly better. Dr. Mason has the matter in charge.

NEW CATALOGUES.

WHAT is the matter with the new catalogues? If you want them noticed, send them in; and if perchance we overlook it, please jog our memory.

GARDENING AND BEES.

E. L. PRATT says, in the *Apiculturist*, that there is no pursuit that can be worked with bee-keeping to such advantage as gardening under glass.

THOSE OUTSIDE WINTER CASES.

THESE seem to be doing nicely so far in our apiary. The bees seem to be in just as nice condition as those in large chaff hives. So far we feel very much encouraged as to their ultimate success.

THE SLATTED HONEY-BOARD.

THE slatted honey-board is now scarcely ordered, and we have almost ceased making them. Fixed distances and thick top-bars are running it out entirely. Of course, queen-excluding honey-boards are as popular as ever.

HOFFMAN FRAMES.

THESE are growing exceedingly popular, judging by the way orders are coming in for them. It fans E. R.'s conceit mightily to think that he helped to call attention this fall to something so manifestly good and useful in the bee-hives. Mr. Julius Hoffman is a benefactor.

SILO AND SILAGE, BY PROF. COOK.

THE third edition is now out, and more than 25,000 copies have been sold in less than two years. The book will be worth many times its cost to any of our readers who have even a small interest in this wonderful invention in agriculture. Mailed from our office for 25 cts. We will send GLEANINGS and the silo book together for $1.15.

THE NEW DRESS OF THE AMERICAN BEE JOURNAL.

THE Jan. 1st number of the "old reliable," always-on-time bee-publication is before us. While its pages have been reduced to a size slightly smaller than these, the number has been increased to 32 instead of 16 as formerly. Its general appearance and make-up, as usual, are good, and it is printed wholly from new type. With this number the *American Bee Journal* celebrates its 30th year of existence, and we wish it many more happy New Years.

A NEW BOOK BY FRIEND COWAN.

"THE Honey-Bee" is the title of a new book by Thomas William Cowan, editor of the *British Bee Journal*. It contains over 200 pages, detailing the natural history, anatony, and physiology of the bee. Some handsome original engravings adorn the pages of the book. We have not had time to review it, but we will do so a little later, reproducing a sample of one of the enlarged engravings of the honey-bee, showing the internal organs.

PRINTING PRICE LISTS.

OUR facilities for printing apiarian price lists were never better than now. We have an enormous selection of electrotypes from which to choose; and having put in another new press, we are enabled to do work cheaper and more expeditiously than ever before. A catalogue is now before us which was evidently printed at some local printing-office. A cut of the one-piece section is upside down, and the size of the sections is given at 4½x4¼. We find other errors that would have been corrected by any one who knows any thing about bees.

PAINTED MUSLIN VS. PAINTED TIN FOR COVERS TO HIVES.

SOME one has said, we do not know where, that painted muslin answers excellently in place of tin for covers to hives. Muslin or common cloth is stretched over the board cover, and nailed around the edges. It is then given two or three good coats of paint. Of course, it can not be quite as durable as tin; but if it can be made to answer for several years, we could afford to re-cover the hives. Who has had lots of experience in this matter? If outside winter cases can be covered with painted cloth instead of tin it will make them cheaper still.

QUEEN-EXCLUDERS, AND WHEN TO USE AND WHEN NOT TO USE THEM.

OUR best bee-keepers seem to think that perforated zinc queen-excluders are not a necessity in the production of *comb* honey. The instances in which queens enter the supers are so rare that it is not worth the expense and time in putting them on the hives. For *extracted* honey, excluders are fast being regarded a necessity. Queens are much more apt to enter extracting-combs than the sections. The reason is, because the former are more nearly of a natural thickness; and in the latter, the cells are so deep that the queen is quite discouraged.

THE AMATEUR PHOTOGRAPHER'S HANDBOOK.

We have had a call at various times for a good book on amateur photography; but heretofore we have not been able to furnish something that was up with the times, simple in style, and reliable in instruction. Most of the books are too complex, and suited only for the professionals. Recently our attention has been called to the Amateur Photographer's Handbook, by that very fascinating author, Arthur Hope. It is easy to see that he has been through all the "experiences." His style is so captivating, and so simple and plain, that almost any boy will be enabled to turn out good work. In fact, if he is inclined to run into hobbies he will be carried clear away with the book, and with the subject with which t deals

The work is so excellent that we have decided to place it on our book-list, and can furnish it postpaid by mail, in paper cover, for 75 cts.

THE CAPPINGS DEPARTMENT

Of the *Canadian Bee Journal* is interesting and well edited. It gives the best thoughts of bee-keepers, no matter where uttered, with substantial credit, not only of the writer, but of the bee-journal as well.

YELLOW CARNIOLANS.

A GOOD deal is said in the *Apiculturist* about yellow Carniolans. If they resemble the Italians at all, how are we to distinguish them from the bees from sunny Italy? The typical Carniolans we have tested seem different from Italians only in color. Make the color the same, and we could not tell which from t'other. Who will be the lucky man to introduce yellow *black* bees?

A VISIT FROM A VERMONT BEE-KEEPER.

OUR friend and correspondent, J. H. Larrabee, of Larrabee's Point, Vt., and secretary of the Vermont Bee-keepers' Association, made us a pleasant call last week. He is one of the parties who helped to get up the bee-keepers' camp on Lake George last summer. He is a wide-awake and progressive bee-keeper; and the name "Genial John," as given him by Rambler, seems to fit him well. Perhaps we shall hear more of him later.

THE BRITISH BEE JOURNAL TO SUBSCRIBERS TO GLEANINGS.

UNTIL further notice we will furnish the *British Bee Journal*, published weekly, at the same price as GLEANINGS—$1.00 a year. The regular price of the *British Bee Journal* is $1.50. We are enabled to do this by exchanging a certain number of GLEANINGS for the same number of the *B. B. J.* After the number to be exchanged is taken up, the price will be as heretofore—$2.40 for both.

THE NEW YORK STATE BEE-KEEPERS' ASSOCIATION.

THIS meets Jan. 22, 23, and 24. The character of the discussions and essays, together with the prominent bee-keepers whose names are attached, bespeak a splendid meeting. This three days' session, together with its prominent bee-keepers, will make this convention rank in importance next to one of the N. A. B. K. A. See published program elsewhere. Ernest or A. I. R. expects to be present.

QUEEN-EXCLUDING HONEY-BOARDS MADE OF WOOD.

THESE have been made before with the slots *parallel* to the grain, but they were discarded because of the shrinkage of the wood and consequent moisture of the hive. But the G. B. Lewis Co. are now making them with the slots to go *across* the grain, and they predict their success. By the way, this firm has lately made a dovetailed hive out of ⅞ lumber, and they sell it at a very moderate price. The testimony of all apiarists has been against any thing less than ⅞ inch for the walls of the hive; but here will be a chance for somebody to test the matter.

TWO NEW BEE-JOURNALS.

Two more new bee-journals were issued Jan. 1, this year. The first that comes to our table is the *American Bee-Keeper*, edited and published by the W. T. Falconer Co., Jamestown, N. Y. It is nicely printed, 16 pages, with a neat and attractive tinted cover. Such bee-keepers as Dr. Miller, Dr. Tinker, Mrs. Harrison, E. L. Pratt, Mr. Holtermann, and others, have written for it. The other journal is the *Bee World*, edited and published by our old friend and correspondent, W. S. Vandruff, Waynesburg, Pa. The latter is a 16-page monthly. Price 50 cts. per year. It starts out well. Success to the new publications, is the wish of GLEANINGS.

THE PROJECT TO MOVE A WHOLE APIARY IN WINTER TO COLORADO.

OUR friend O. R. Coe, still at Windham, N. Y., who, it will be remembered, was proposing to go to some alfalfa fields with his apiary, has settled upon his location, which is Fort Collins, Col. He has ascertained that it is in the midst of the Rocky Mountain bee-plant and alfalfa bloom, and proposes to get his bees into the field early, and be ready for the honey-flow. He is going to move a carload of bees to his new location this winter. In a letter just received he expresses a fear that he may not be able to move the bees as soon as he desires, on account of the almost impassable condition of the roads to the railway station, by reason of the great depth of snow, and the consequent drifts. He writes, under date of Dec. 27:

Never, since I can remember, have we been so completely blocked in by snow early in the winter, as now. Our roads, many of them, are utterly impassable from drifts—as much so as they were in the great blizzard of three years ago next March.

BALL'S ALFALFA AND SORE THROAT.

A MEMBER of the Root family was suddenly taken in the night with a distressing sore throat, followed by coughing, and difficult and painful breathing. Trask's ointment and gargling of salt water had no effect. Now, there happened to be in the house about half a tumblerful of Ball's alfalfa. This honey was liquid, and of beautiful body and color. Without much faith, this was given to the patient. Almost instantly came relief. That rich and beautiful honey acted like a soothing oil upon a throat raw with coughing. After a little the distressing symptoms returned, and again the honey was administered, with like results, and so we kept up the program until it was gone. Then we traped around the house until we found a bottle of white clover. We tried this, but it had no effect. We next gave the patient the scrapings of the alfalfa jar, and, like oil to a hot box, it went to the spot. Temporary though it was, it relieved a great deal of suffering and no little "scare." It seemed to cut the mucus, and protect the raw sores in the throat.

[The above from Ernest sounds pretty strong for alfalfa honey; and although I confess I do not understand why alfalfa honey should have any particular virtues over other clover honey, the facts in the case given seem to decide that there must be a difference somewhere. If this be true, then may it not reasonably be presumed that honey from other plants may have special virtues for particular ailments.]

STATISTICS.

THE other day a correspondent, having in view the preparation of an essay to be read at a farmers's institute, desired us to furnish him with statistics as to the number of colonies in the United States, the number of pounds of honey and wax produced, etc. There have been no reliable statistics made, although some pretty good guesses have been given. It was estimated, two or three years ago, that there were 300,000 bee-keepers in the land, and that the number of colonies, if each owned not less than ten, would be 3,000,000. Allowing 10 lbs. per colony, the annual product would be 30,000,000

lbs. But the probabilities are, at this date, that the number of bee-keepers has increased to 500,000, and that the annual product of their hives has increased at least in proportion. The government statistics as touching honey which we have had so far would be too unreliable to quote.

DISCARDING OLD THINGS AND TAKING UP NEW ONES.

FOR a good many years GLEANINGS has been slow in adopting improvements in bee culture. One reason of this is, that, more than a dozen years ago, there was quite a protest against introducing so many new fixtures. The protest was just, and I confess I feel now a good deal of anxiety when so many new things are coming up, being illustrated and offered for sale; and I do believe that we should always be slow in bringing to our apiaries different arrangements. It is well to present these things and discuss them; but before adopting them I would let our Question-box corps give their opinions. If a change is to be made, let us have the reasons in full for demanding the change. Let us take the Hoffman frame as an example. It is by no means a new thing, but its revival is new. While I feel somewhat doubtful as to whether it is going to obtain a permanent place in our hives, there are two reasons just now for its adoption. Out-apiaries are taking a place in our industry that they never did before; and there is also a strong demand for something to do away with the burr-comb nuisance. If the bees *will* build combs, have them build them where they are worth money instead of where they are a nuisance. To do this we want fixed distances; and if we want fixed distances, perhaps nothing better presents itself than the Hoffman frame. Please remember, friends, that A. I. Root, while he lives, is going to protest and hold back against the introduction of any thing new until there is some very good and plain reason for burdening the brotherhood with new and additional expenses.

THE NATIONAL BEE-KEEPERS' UNION.

THE 6th annual report of the General Manager, Mr. Thomas G. Newman, Chicago, Ill., is before us. Mr. Newman says:

"When attorneys are defending cases in courts, they often cite the suits previously decided, which favor their argument, or are analogous to it. * * * * When bee-keepers are their clients, they should be able to point to decisions or points of law in favor of the pursuit. * * * * In the first case defended by the Union, Judge Clementson remarked: 'This case involves new points of law upon which there are no rulings of the Supreme Court. We have no law upon which to instruct a jury.' That was in the Freeborn case, in Wisconsin, which the Union had defended so vigorously that the complainant lost his grip in the first round, and it was literally kicked out of court. We have now secured several decisions, notably the one in the Supreme Court of Arkansas. These not only save trouble and annoyance to bee-keepers, but also expense to the Union, by the prevention of petty lawsuits.

"Now, if city councils or town boards are anywhere troubled by a complainant, and asked to pass an ordinance declaring bee-keeping a nuisance, and to prohibit it within the corporate limits, etc., every member, together with the mayor, the city attorney, and the one making the complaint, are all dosed with copies of the Supreme Court decision, that 'bee-keeping is not a nuisance' *per se*, and the matter is at once dropped—killed by the decision of the Supreme Court of Arkansas!"

In the one point of establishing precedents, the Union has performed a grand work; and even should it now be disbanded, these precedents will go on, having their influence just the same; but there is no likelihood of the Union being disbanded so long as T. G. Newman remains back of it; and under his efficient management we have no doubt that it will continue its good work. It has two more cases on hand, and the General Manager is in hopes that they will be landed in the Supreme Court of their respective States on account of the valuable decisions that will be, without question, rendered in favor of the bees. The Union has a balance on hand in the treasury of $621.18. It has engaged attorneys for the defense of the several cases above mentioned; but Mr. Newman says we shall have use for all the money on hand, and the dues for the next year, as the cases are reached on the docket. To become a member, send $1.00 to the General Manager, as above.

OLD SQUARE CANS FOR CALIFORNIA HONEY; HOW CALIFORNIANS ARE BREAKING DOWN THEIR MARKET.

IT is a well-known fact, that square cans are used almost exclusively for shipping kerosene from the East to the Pacific coast. After being emptied they are filled with other liquids, and shipped back again. The worst part of it is, they are being used largely for extracted honey. It is true, they are scalded out, and then the first quality of extracted honey is put in and sent by the carload to the East. Some cans that our men have examined leave us in doubt as to whether they were ever scalded. Sometimes the flavor of the honey is seriously deteriorated, and at other times it is scarcely perceptible. Our friend and correspondent, J. F. McIntyre, a Californian, it will be remembered, has written against the use of oil-cans for packages for honey.

The great difficulty in the way is, that the California markets, at present, will not pay the difference between honey put up in new square cans, and that put up in those formerly used for kerosene. And still another thing is, that these oil-cans can be had for 50 cts. per case less than the new ones; and some of our Western bee-keepers, looking to immediate gains, buy the cheaper packages. If they will reflect a moment, they will see that, in time, they will ruin the Eastern markets for all California honey, or, at least, make it so it will drop a cent or two—a thing that California bee-keepers can not afford to have happen.

Now, if you Californians *must* use coal-oil cans, use some alkali to cut the residue of grease that clings to the inside of the cans. Hot water will not remove it; but a very little weak ammonia will. Yesterday we cut the top off from one of those oil-cans in which had been shipped us some first quality of honey. We were suspicious of the flavor, and hence decided to investigate. The top being removed, we found that a thin deposit of black grease clung to all the six sides of the can. Hot water would not budge it. I then told one of the boys to get one of our 20-cent bottles, holding nearly a quart of ammonia. It is rather weaker than the ordinary commercial article, and is used for washing purposes. Two taplespoonfuls of this were thrown into the topless can. After shaking it around for a minute, the black grease came off entirely, and the sides of the can were as bright and clean as a dollar. I am not sure but that a single tablespoonful of commercial ammonia, mixed with about half a cup of water, would do the same. Remove the cap, pour in the liquid, screw the cap down, and then give the can a good shaking. If this does not re-

move a lot of black, greasy, inky-looking substance, then it will not do as it has done for us here at the Home of the Honey-bees. I should like to have some of our friends in California try this, and then scald out with hot water, and let the cans stand upside down to drain.

It may be argued, that, on a carload of cans, it would make the ammonia rather expensive. A day's time, and about a dollar's worth of ammonia, according to our markets, in its original form, will make enough to renovate a whole carload of cans. This expense is small in comparison with the ultimate reduction of a cent a pound on California extracted honey. Unless old cans are renovated by an alkali, like ammonia, or new cans are used, the bee-keepers of California will be doing themselves irreparable damage. E. R.

SUCCESS IN MAILING A QUEEN TO AUSTRALIA; THE BENTON MAILING-CAGE AND GOOD CANDY PUT TO A SEVERE TEST.

ABOUT a year ago, one of our customers, Mr. Æneas Walker, of Queensland, Aus., sent us an order for two tested queens. We put them up in the regular Benton cage, and provisioned them the best we knew how, but with very little hopes, however, of even the cages ever getting through to their destination, to say nothing about the queens arriving alive in the event they did. There are some restrictions in the Australian mails, and we feared the magnates over there would hold them when they got into their jurisdiction. The cages went through all right, however, but the queens were dead. Our customer, Mr. Walker, wrote to us that the bees had, by their general looks, died within only a day or two — starved to death—their food having been entirely used up. We regarded this at the time as a success, in so far that we delivered two queens in ordinary Benton cages, clear into the country of Australia, alive, and that, if we had just put in a little more candy to have lasted them two or three days more, we could have reported entire success. On the 10th of last October we replaced the two queens, sending them this time in larger Benton cages. One was a tested honey queen, and the other an untested. You will see by the letter below that the tested honey queen arrived in safety, after a journey of 37 days. The untested, for some unaccountable reason, with her attendants, died. Mr. Walker writes:

My Dear Mr. Root:—I am very much pleased indeed to be able to report that the tested honey queen and her attendants arrived here in safety on the 15th inst., having thus had a journey of 37 days. They had consumed only about half of their candy, so that either the number of bees sent with the queen must have been considerably less than in the first instance, or the weather must have been cooler; but any way, it is now satisfactorily demonstrated that queens can be sent safely by mail from America to Australia. The untested queen and her accompanying bees, I regret to say, were dead; and they must have died early in the journey, as less than a quarter of their candy had been eaten.

ÆNEAS WALKER.

Queensland, Redland Bay, Nov. 24.

Both queens were put into the same kind of cages, and the candy was made from the same batch. It is one of those things that we can not explain, why, under precisely the same conditions, one lot of bees should die, and that the other should live. It is very possible (a fact which our correspondent may have failed to observe) that a single bee might have stuck to the candy, directly in front of the opening, and thus prevented the others from obtaining the food. The journey through the mails may in time have dislodged the bee from the candy, and, of course, all apparently died from some unknown cause. This has, in fact, happened several times, as the returned cages showed. The more I think of it, the more I am inclined to believe that this must have been the cause of death; for certainly an untested queen is supposed to stand more in the mails than an older tested one.

Mr. Walker has ordered four more queens, all to be sent in Benton cages. The size of cage to which we are limited in the mails is 5x2x1½ inches, and it is to be covered with a wire screen, protected by a movable wire lid. The Benton cage which we sent conformed exactly to that size. The number of bees which we put in each cage was 35. It is well known that the Benton cage proper has three holes. In the center one we put a thin wooden partition. We filled one of the end holes and half of the center partition with candy, the bees occupying the rest of the space.

I am explicit in all these details, in order that all queen-breeders may accomplish the same thing if they desire, or, at least, attempt it. By way of a feat, I hope that some of our extensive queen-breeders will try the same experiment. They can afford to throw away at least one queen to see what they can do, and Mr. Walker certainly will not complain if he receives a nice Italian queen-bee from America, in good order, especially if no charge is made.

The Benton cage is capable of wonderful results; and if others are equally successful, or more so, it will be a great boon to Australians, and to bee-keepers living in other remote parts of the world from us.

I omitted to say, that we are obliged to put on letter postage—that is, 12 cents per half-ounce, or fraction thereof. This will make the postage on a package such as we sent, $1.04 per queen. Queen-bees in the size of packages indicated above are not admitted to all countries; but the Postal Guide says that we can send them to the Argentine Republic, Belgium, Bulgaria, Chili, Columbia, Congo, Dutch West Indies (Curacoa, etc.), Egypt, Guatemala, Hayti, the Hawaiian Kingdom (Sandwich Islands), British India, Italy, Liberia, Mexico, Paraguay, Portugal and the Portuguese Colonies, Roumania, Siam, Spain, and Switzerland, as "samples of merchandise;" and to Austria, Hungary, France, Germany, Greece, Luxemburg, the Netherlands and Netherlands Guiana, and Sweden, provided postage is fully prepaid thereon at the letter rate; viz., 5 cents per half-ounce or a fraction thereof.

You will observe that Australia and her provinces are not included; but I think there will be no trouble when full letter postage is put on.

Later.—Since the above was written, a letter comes to hand, from Mr. John Sench, under date of Dec. 18, acknowledging the safe arrival of two queens, at Port Morant, Jamaica, West Indies. Nov. 25, last year, we sent two select tested queens, put up in Benton cages, the same size as above given, and put on letter postage; namely, 5 cts. per half-ounce in this case. Our customer does not say just *when* the queens arrived; but presuming that he wrote immediateiy, or soon after their receipt, the bees must have been nearly a month on the way. We have tried sending queens several times before in *Peet* cages, with Good candy, but there was a failure in every instance. We must attribute the secret of this success to the Benton cage, for the candy, namely, powdered sugar and honey, mixed to a stiff dough was used in the Peet cages before. Perhaps I should add, that the queens were first sent to a forwarding house in New York, and from there they were sent direct to the address as above. E. R.